

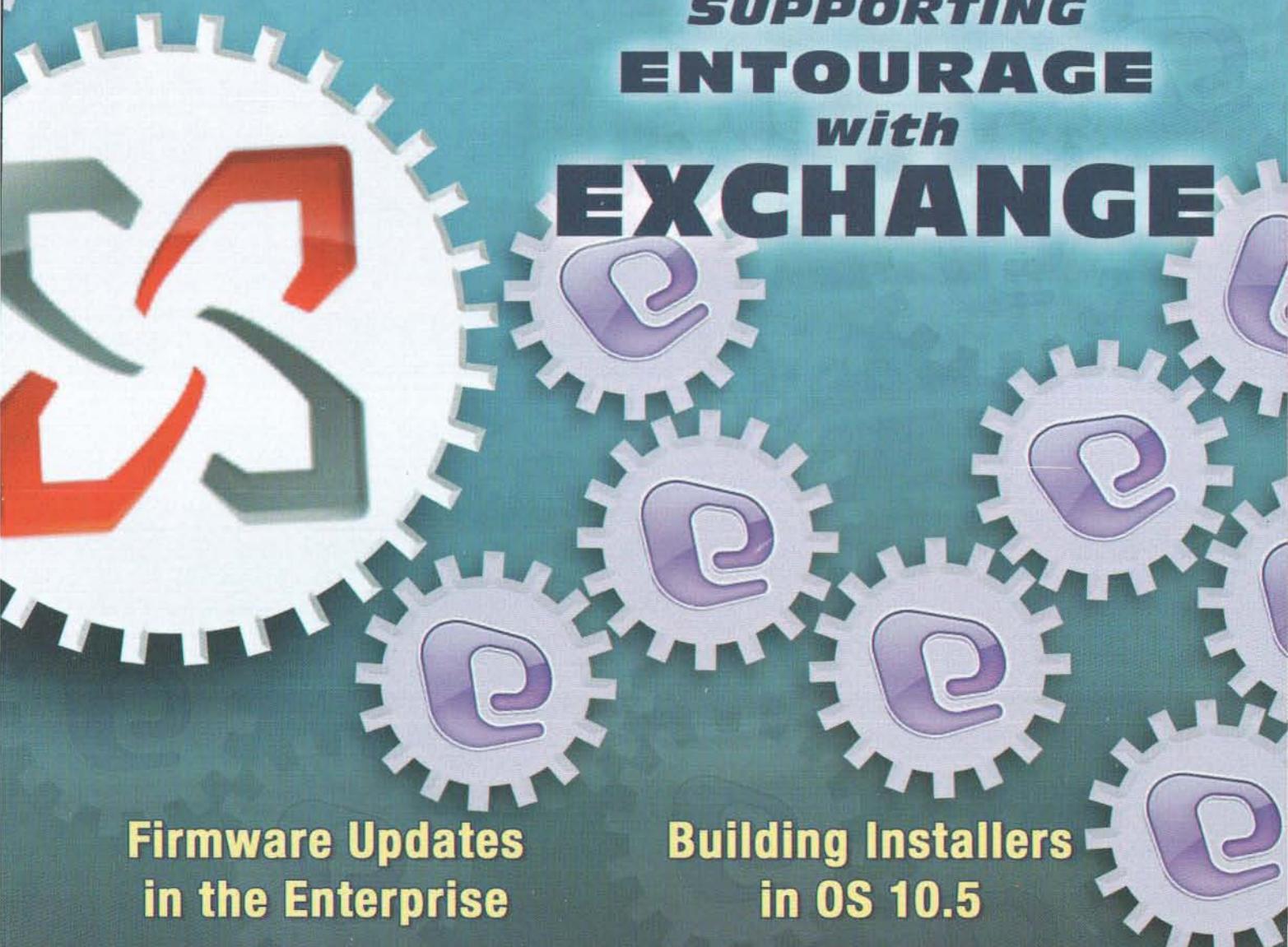
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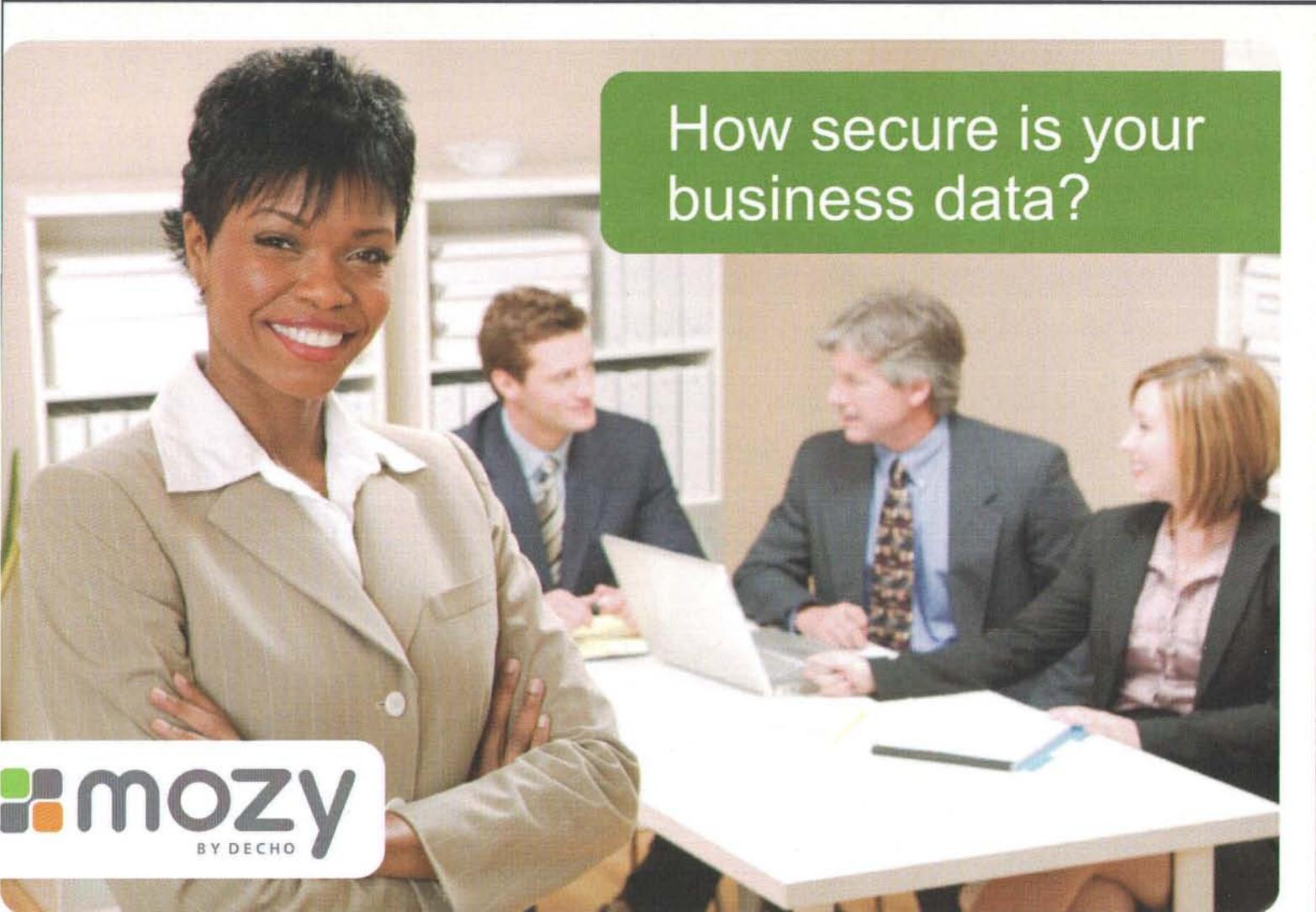
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# From the Editor

June is certainly an exciting time in the Macintosh universe, as we're only a month (or less) away from WWDC. For those of you new to the Mac scene, or those that need a reminder, Apple's World Wide Developer Conference is the event that sets OS X-based development in motion. Since the iPhone is OS X-based as well, we'll get Apple supplied content about its intricacies also. For those that haven't attended before, but are planning to, make sure you avail yourself of the access you'll have to Apple personnel. If you are developing an OS X-based application, and are running into some show-stopping bug, or even need UI advice, there are few other times that you'll have access like this. Sometimes, it means skipping a session to avoid a huge queue that stops you from getting to *another* session—or from getting lunch! Also, make sure you get together with your peers; you know, those names you only know from mailing lists and such. Put a face to them. Enjoy a drink or a meal with someone who has given you good advice or outright saved your job by sharing a snippet of code or teaching you a new command that got your server back up and running.

But all of that is for next month. This month, we've got some great authors writing about great topics. First and foremost is our cover story: author William Smith returns with the authoritative reference on supporting Entourage in an Exchange environment. If you need to connect OS X users to Exchange using Entourage as a client, no matter the number of clients, this is a must read.

Another returning author is José Cruz, building on his packaging work. This is another in-depth article in creating Apple packages to deliver applications. No matter your discipline—Sys Admin or Developer—this is a valuable skill.

The Road to Code moves on to a new milestone: covering Windows, Panels and Sheets. This is like, real GUI work! Bring your product to the next level with a GUI for the end user.

For those of you with a product idea and wondering how to get started as an independent software vendor (ISV), Oliver Popisil and Michael Göbel are doing just that, and are here to share their experiences. Their Macintosh-focused examples should provide plenty of inspiration for anyone thinking of pursuing this road for releasing a product themselves.

If you're a System Administrator of any decent sized fleet of Macintosh machines, you know the pain of installing a new Apple firmware update across them all. Greg Neagle is here with some good news! Perhaps not *exactly* the news you're looking for, but certainly a way to ease the pain.

This month's Mac in the Shell column continues the focus on learning Python. This month, you'll learn more about classes and object oriented application creation. If you've been following along, this is one of the lynch pins of the Python experience, so, don't miss it!

The MacTech Spotlight this month features Jean-Daniel Dupas, Mac developer at Nindsight. I'll call him Mr. Humble, as he didn't make mention of one of his wonderful (and free!) applications that he offers through his personal site, Shadow Lab: <http://www.shadowlab.org/Software/spark.php>. Jean-Daniel offers some open source code and software via Google Code as well. He has a wide range of experience and wears many hats.

We hope to see everyone out in San Francisco for WWDC!

Edward Marczak,  
Executive Editor



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by Edward Marczak

## Learn Python on the Mac: Classes

### Building a Basic Class

#### Introduction

Last month, we covered conceptually what classes are, why they're useful and when you may use them. This was all done with no (real) code. None of the nitty-gritty. That's where we're headed this month. So, without further ado, let's get into some Python code!

#### Modeling the Real World

Traditionally, defining a class is the mechanism that allows the code author to create a "factory" for churning out (instantiating) objects. Python is a little different in that everything is treated as an object whether you are aware of that fact or not. As we discussed last month, you use a class when you have a model in the real world that you'd like to follow. In his Road to Code column, Dave Dribin has been using shapes as objects. A single shape *class* can be used to model shapes from the real world: a square, a rectangle, etc. We're going to use a different example that's just as grounded in the real world: a bank account.

Before getting into the code, it's wise to plan out a class: what is it's structure? A class can hold *instance variables* and *methods*. An instance variable is simply a variable that is specific to a given class. Similarly, a method is a function that resides internal to a class, and can act on instance variables stored in a class.

What do we need to plan out our bank account class? Well, the account should have some method of identifying it – a name or number, perhaps. Since this is a small example, and we're not worried about name conflicts, and we don't want to treat people like a number, let's just go with name. That's one,

actually two, instance variables: First Name and Last Name. The account will also have a balance, our third instance variable.

What actions do we need to take these variables? Focusing on the balance, we certainly need to deposit money. That's our first method! We'll also want to withdraw this money at some point, which will be our second method. Let's start modeling the class from here.

#### Bank Account Class

First thing's first: create a directory for this project. I'm using "Bank\_Class", but you're free to call it what you wish. Inside that directory, I'm creating a file named "Bank\_Class.py". Use vi, BBEdit or whichever plain text editor makes you most comfortable.

First thing is first; the magic shebang line:

```
#!/usr/bin/env python
```

As shown last month, classes always begin with the *class* keyword to define them:

```
class account:
```

and we said we need three instance variables: balance, first name and last name. We can define them here (but please read on as we're going to refine this!):

```
class account:
    balance = 0
    fname = ''
    lname = ''
```

From here, we can actually use this class:

```
acct = Account() # Instantiate a new Account
print 'Account balance is', acct.balance
print 'Depositing $50'
acct.balance = acct.balance + 50
print 'Balance is now', acct.balance
```

Which yields the output:

```
Account balance is 0
Depositing $50
Balance is now 50
```

Now, just because we can doesn't mean that we should! This code will work, but it has a few holes. One large issue being that we don't have to assign a name to this account, and this is what we hoped to be our identifier. If there are actions we want to take, including assignment, every time we create an instance, we can define a *constructor*. A constructor is just another function (or, *method*). What makes it special is that it will run every time the class is instantiated. Defining a method named *"\_\_init\_\_"* creates a constructor (that's two underscores

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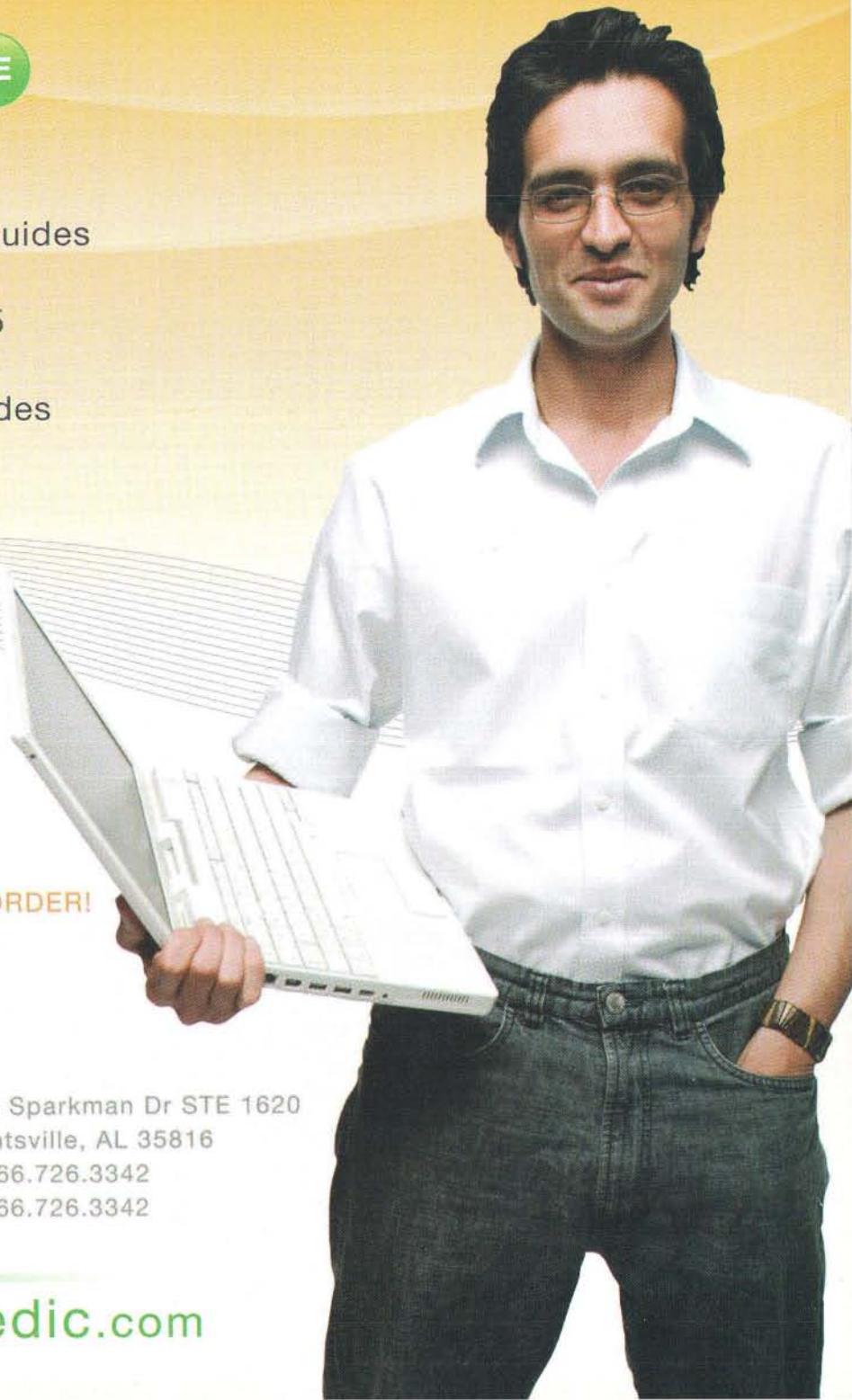
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and the word 'init' followed by two underscores. Instead of the small tangled mess shown above, we can define the following:

```
class Account:  
    def __init__(self, fn, ln):  
        self.balance=0  
        self.fname=fn  
        self.lname=ln
```

Now when we instantiate the class, we can call it like this:

```
acct1 = Account('Bill', 'Smith')
```

This will create the account with a zero balance and assign the first name as "Bill" and the last name as "Smith". If we forget one or both parameters, the class will raise an error.

## What's with the "self"?

Python requires that there be an additional first parameter to a class method. While you could technically name it anything you like, it's canonically called `self`. The Python runtime will automatically supply the value for this parameter at runtime. The `self` parameter is an object reference used to pass instance values to the method. While you can call it anything you like, all of the Python documentation uses "self," along with, well, every Python author that I know or have seen.

So, stick with the convention of "self." It'll help you, or anyone that needs to look at your code in the future.

## Additional Methods

Now that we can instantiate a new bank account, we'll want to act on it. We've already decided that we need at least two methods: deposit and withdraw. Add the methods to the class (remember the right indentation!):

```
class Account:  
    def __init__(self, fn, ln):  
        self.balance = 0  
        self.fname = fn  
        self.lname = ln  
  
    def Deposit(self, amount):  
        self.balance += amount  
  
    def Withdraw(self, amount):  
        self.balance -= amount
```

Now we can create a new account, deposit and withdraw money. (Note the use of the `+=` and `-=` operators. This is simple shorthand for repeating the left-hand variable. `x = x + 1` can become `x += 1`). Unlike the first version of this code shown above, we don't have to set the variables ourselves, but rather we use a method to do it for us:

```
acct = Account('Joan', 'Smith')      # Create new account  
print "Acct1 Balance = ", acct1.balance
```

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```
print "Depositing $50 to acct1"  
acct1.Deposit(50)      # Note use of class method here  
print "Acct1 Balance =", acct1.balance
```

Naturally, there are some holes with this. There are no sanity checks to see if there's any money in the account before we withdraw it, for one. That is an improvement left to the reader.

## How is this better?

Well, the examples given thus far haven't done much to improve on traditional procedural programming. However, now that we have the structure in place, it's easy to go beyond that. Creating multiple accounts, for instance is as simple as an assignment:

```
acct1 = Account('Joan', 'Smith')  
acct2 = account('Bob', 'Smith')
```

And we can perform discreet actions on each:

```
acct1.Deposit(50)  
acct2.Deposit(1000)  
print "Acct1 Balance =", acct1.balance  
print "Acct2 Balance =", acct2.balance
```

You should be able to visualize a dictionary structure filled with accounts. Or, the ability to find a record in a database and loading the found record(s) into an Account class.

## Conclusion

Between last month and this month—please ensure that you also understand the material presented last month, too!—you should have a pretty good idea what classes are, how they work, and how to start building your own. Next month, we'll get into some OS X-specific functionality of Python and build some useful classes.

Media of the month: <http://www.facebook.com>. Seriously. OK, pick and social network, but Facebook seems to be the biggest. And then go say hello to someone you miss.

Hope to see everyone at WWDC next month! See you in San Francisco!



## About The Author

**Ed Marczak** is the Executive Editor of *MacTech Magazine*. He lives in New York with his wife, two daughters and various pets. He has been involved with technology since Atari sucked him in, and has followed Apple since the Apple I days. He spends his days on the Mac team at Google, and free time with his family and/or playing music. Ed is the author of the Apple Training Series book, "Advanced System Administration v10.5," and has written for *MacTech* since 2004.

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# Pain Management

## Dealing with Apple firmware updates in an enterprise environment

By Greg Neagle, MacEnterprise.org



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Mac OS X enterprise deployment project

### Introduction

You've made fantastic progress on your systems management infrastructure for your organization's Macs. You have a method to create standard images. Maybe you are even using InstaDMG. (If you haven't heard of InstaDMG, fire up a browser and do a search now!) You have an imaging server to quickly get these images on new Macs – maybe NetInstall, NetRestore or Deploy Studio, or one of the commercial solutions. You've implemented software to install and update applications and OS patches – perhaps you are using the open-source radmind tools, or Apple Remote Desktop, or a commercial package like the Casper Suite or LANrev. You've even gotten good at using the command-line and ssh to remotely connect to a machine and troubleshoot and fix issues. Your environment is predictable, structured, and managed. Life is good.

Now that so much of your job is automated and streamlined, you are sitting in your office, browsing the web and looking at Mac tech sites. Suddenly, you see something that just ruins your whole day. Apple has just released a firmware update.

### What's the big deal?

So why should a firmware update cause you heartburn? Can't you just use your fancy software distribution tool to push it out to the affected machines? Well, you can push the firmware updater, but in most cases, you can't actually install the firmware remotely or in an automated fashion! Worse, for EFI firmware updates, a person must physically press the power button long enough to start the update after a shutdown. What a pain. All your centralized automation goes out the window, and once again, you are doomed to a life of running from machine to machine – installing updates.

### The bad news

So now you are reading with bated breath (look it up – it's not "baited breath" – which makes me think of halitosis...) and hoping that your humble author will make all the pain go away. I am truly sorry – that is not within my power. I can't make your pain go away – I can only help you manage your pain.

### Pain Inventory

There are two major challenges posed by Apple firmware updates. The first is finding out about them. Since firmware updates are generally for specific hardware models, unless you have one of everything Apple's ever shipped in your office, you won't find out about every firmware update simply by looking at Software Update on your machine. You'll need a way to find out about firmware updates that apply to all the various hardware in your organization.

The second challenge, as implied above, is deploying those updates. You cannot deploy these like you do OS updates or security updates. You'll need another method.

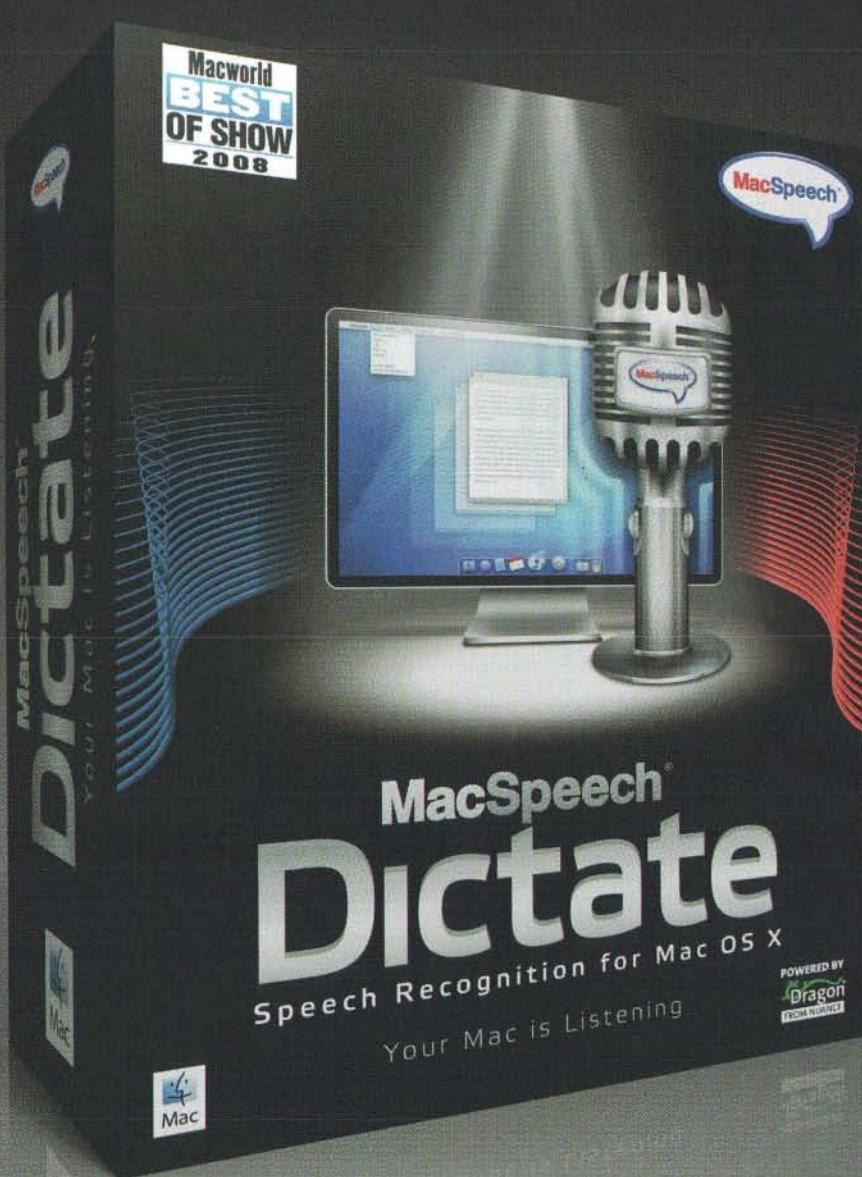
### Pain Awareness

Let's tackle the first challenge. You have a few options. The first and most obvious is to check Mac tech websites or Apple's support downloads page at <http://support.apple.com/downloads/> on a regular basis, checking for firmware updates. That's tedious, and since Apple firmware updates are relatively uncommon, something you're not likely to remember to do consistently.

Another possibility, if you have a machine running OS X Server, is to turn on the Software Update Server and monitor what it downloads. A Software Update Server will download

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all Apple updates without regard to which hardware it applies. You can then look through the list of downloaded updates periodically. A tip: sort the updates by Post Date, and filter the list by typing “Firmware” into the search field. This will give you a list of firmware updates (at least those for which Apple has included the word “Firmware” in its name) and puts the most recent at the top. See Figure 1 for an example.

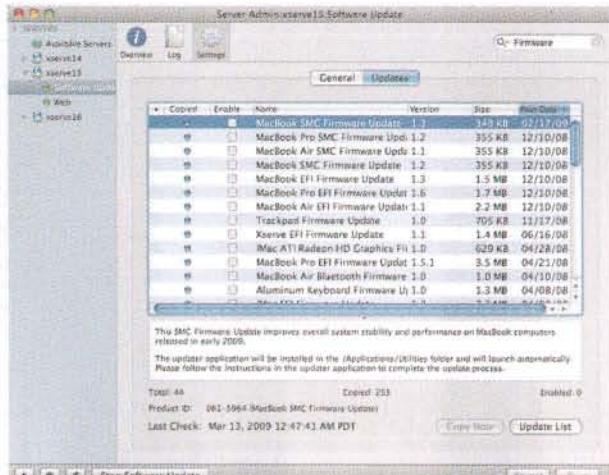


Figure 1. Software Update Server

Again, this can be tedious, and you'll certainly find listings for updates that apply to hardware your organization does not own. Still, this works as a method of discovering what firmware updates Apple has made available.

Another possibility is to farm out the discovery: since firmware updates apply only to specific models of hardware, you could have a script that runs on every machine that you manage that runs the command-line version of Software Update (`/usr/sbin/softwareupdate`) and looks for available firmware updates. Here's a one-liner:

```
/usr/sbin/softwareupdate -l | /usr/bin/grep -i firmware
```

This will print available firmware updates for the current machine. You could expand on this – perhaps emailing you, or posting this info into a database. In fact, later on in this column we will expand on this technique.

## Approaches to Pain Management

Now you have a method of finding out that firmware updates are available. Next, you must find a way to actually deploy these updates. In my organization, I tried a couple of approaches. The first was simply verbal. I asked all the technical support people to check Software Update for available firmware updates whenever they had to visit a user and if there were any, to apply them. Not surprisingly, that didn't really get the job done.

Hex color picker plugin for Mac OS X system color panel.

# Web Color Picker

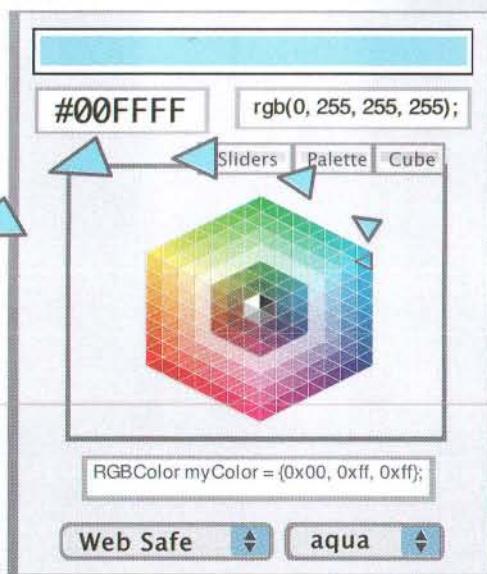
A must have utility for web designers and developers. A handy color selection tool for everyone.

### Color To Code

Hex Color Picking: Pick a color with the mouse, paste the HTML hex code. No typos, no counting to 6, no crib sheets - immediately visualize the color.

```
121 ...
122 // Define Button Background
123 RGBColor myColor = {0x00, 0xff, 0xff};
124 [myColor set];
125 //Define Button Border
126 ...
127
```

Drag and drop full code snippets: pick a color with the mouse, drag the corresponding color specifying statement to your source code - zero typing, no compiles to "see" the color.



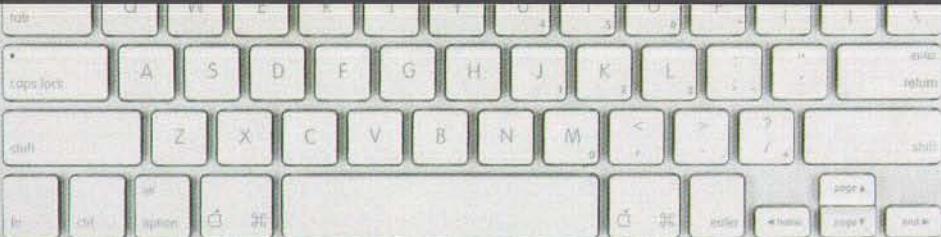
### Code To Color

Copy a color text specifier from your source code to WebColorPicker and immediately see the actual color with confirming matches to a master color table.

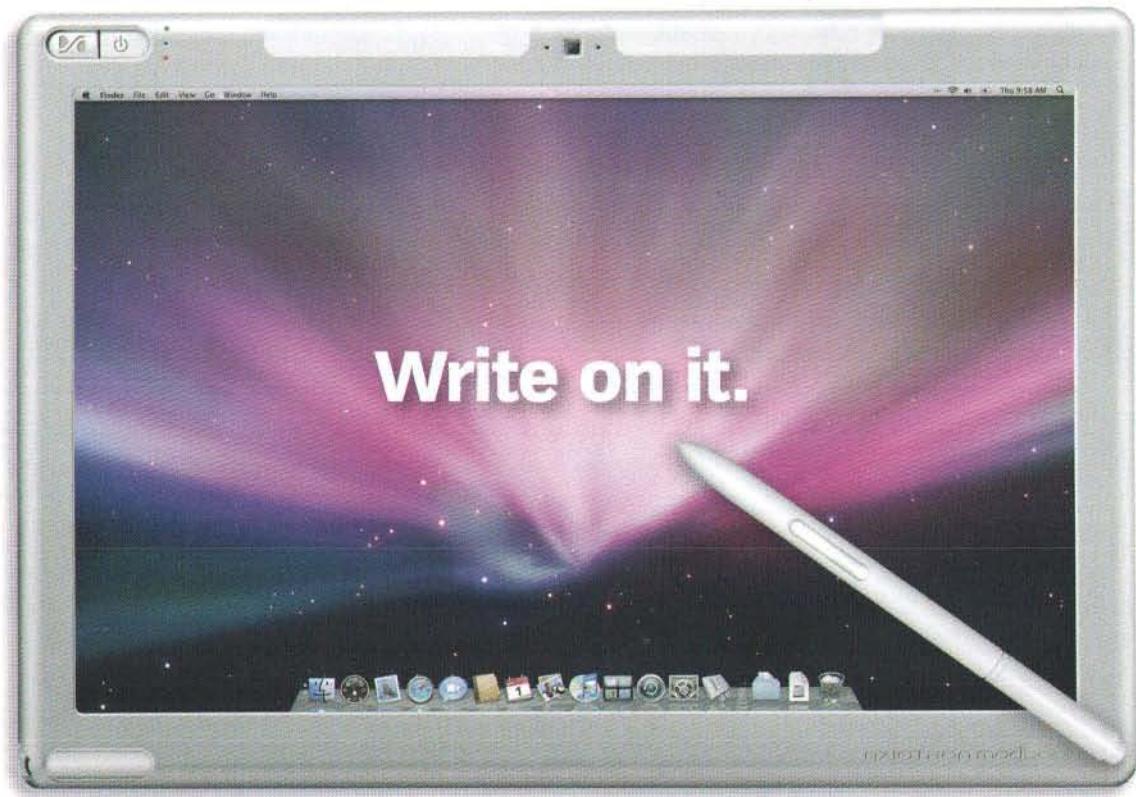
3 Color Selection Views:  
Hex Sliders,  
Color Tables,  
Color Cube (shown here).

3 Color Tables:  
Web Safe,  
CSS Keyword,  
SVG standard colors,  
(use with your own color table).

Languages Supported:  
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The next approach I tried was to try as hard as I could to automate the application of firmware updates. I was seduced down this path by Apple's SMC firmware updates for the first generation of Intel Macs. These SMC updates were the ones that enabled Boot Camp, among other things, so I was quite anxious to get them out there. It turned out that you could automate SMC firmware updates, and I wrote some scripts to do just that. You can see them here:

<http://managingosx.wordpress.com/2006/10/27/automating-firmware-updates/>

and here:

<http://managingosx.wordpress.com/2006/11/02/automating-intel-firmware-updates-ii-revenge-of-the-smc/>

Ultimately, this was not a sustainable solution. It only handled SMC firmware updates, not any of the other types of firmware updates, and since the path to the actual firmware updater was different for each machine type, and since you had to keep track of the SMC firmware versions each updater was for, it quickly became a house of cards. You needed to continually update the scripts and the firmware installers as Apple released new hardware and new SMC updates. And there were still the EFI updates, and the Graphics Firmware updates, and the Trackpad and Keyboard Firmware updates and more to deal with.

Back to the drawing board. Approach number three was a script that ran at startup, ran `softwareupdate -l` and emailed me (or rather, my group of administrators) if a machine needed a firmware update. I'd then add that task to our helpdesk ticketing system for a technician to do. Needless to say, the technicians didn't like this solution very much, but it worked, to a point. Still, we were missing ideal opportunities to update the firmware when a tech visited a machine for other reasons.

If these updates could not be automated, what we wanted was something that:

Notified the user and us that a firmware update was needed for the machine. Since most of our users are not administrators, they could not actually perform the update, but at least they could notify the help desk for assistance.

If a tech was working on a machine and was logged in as an administrator, upon login they would be notified there were available firmware updates so they could install them right then.

With those desires in mind, I wrote a script to be run at each login that checked the output of `softwareupdate -l` for available firmware updates, and if any were found, it would display an alert informing the user to contact the help desk if they were not an administrator, or urging them to install the update if they had admin rights.

A version of the script follows. Yes, it's written in Perl, and I know all the cool kids are now using Python. Perl's support for regular expressions and straightforward support for calling system command-line tools make it a good fit for this type of script. Feel free to rewrite it in bash, Python, Ruby, or whatever makes you happy. Let's take a look.

```
#!/usr/bin/perl -w
use strict;

# change 'com.myorg' to your organization name
my $prefs = "com.myorg.firmwareupdatecheck";
```

As a nicety, we're going to set things up so that this only runs once per day – that is, if a user logs in and out several times in a single day, he or she will see a firmware update alert (if one is needed) only once a day. If you want to be more insistent, you could remove this check. If you do, and a firmware update is available, the user will be notified at every login. Alternately, you could increase the interval so that not every machine hits the Software Update server (either your local one, or Apple's via your Internet connection) every single day.

```
# check the last time we ran on this machine:
# exit if we already ran today so we don't annoy too much
my $now = time;
my $lastChecked =
  `defaults -currentHost read $prefs lastChecked
2>/dev/null`;
chomp $lastChecked;
if ($lastChecked ne "") {
  my $daysSinceLastChecked =
    int(($now-$lastChecked)/(60*60*24));
  exit if ($daysSinceLastChecked < 1);
}
```

Next, we'll get a list of updates from `softwareupdate` and look through them to find firmware updates.

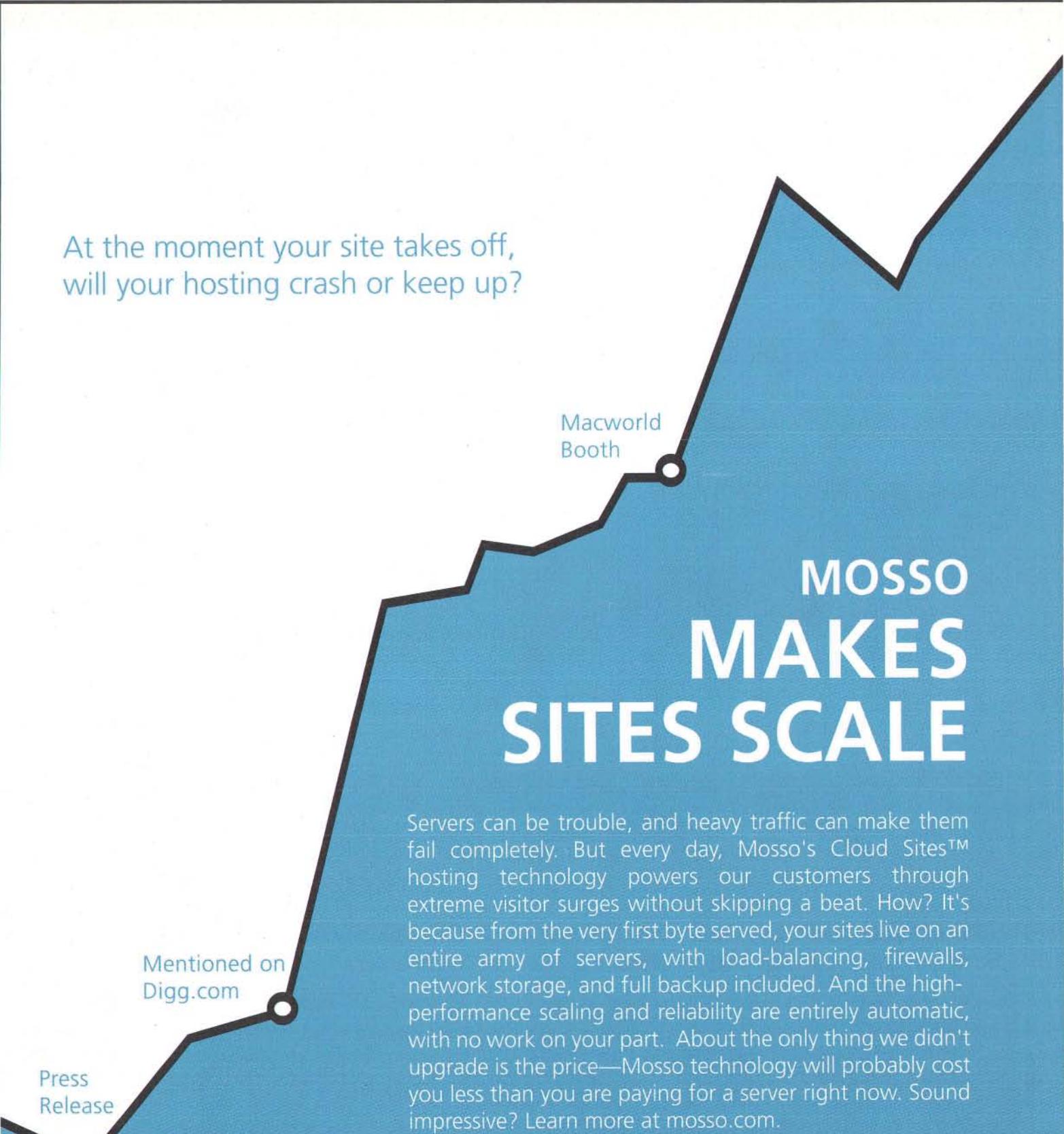
```
# get list of available updates from softwareupdate
my $allupdates = `softwareupdate -l | grep '^ \\\* ``;
chomp $allupdates;
my @updates = split /\n/, $allupdates;
my $firmwareupdates = "";
my $firmwarelist = "";
my $otherupdates = "";

# walk through the list looking for firmware updates
for my $update (@updates) {
  $update = substr($update,5);
  if (($update =~ /[F|f]irmware/) ||
      ($update =~ /EFI/) ||
      ($update =~ /SMC/)) {
    $firmwareupdates .= "$update ";
    $firmwarelist .= " $update\n";
  } else {
    $otherupdates .= "$update ";
  }
}
```

We're looking for "Firmware", "firmware", "EFI", or "SMC" in the name of each available update. Every firmware update I've seen with the exception of a 2005 "iMac G5 Sleep Light Update" has the word "Firmware" in the name, so this should get the job done.

Next, we record when we did this and what we found using `defaults`. This is the same file we read when we start to see if we already ran today.

```
# record when we checked and what we found
```



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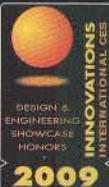
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```
system "defaults -currentHost write $prefs lastChecked -int $now";
system "defaults -currentHost write $prefs availableUpdates '$firmwareupdates'";
```

And now the exciting part! If there are available firmware updates, we're going to notify the user. But before we do, we tell Software Update to hide all the available updates that aren't firmware updates. I do this in my environment because normally we install all the other updates with our software distribution mechanism and I didn't want to get a lot of questions about additional updates available in Software Update. You may want to handle this differently.

```
if ($firmwareupdates) {
    # there are available firmware updates
    if ($otherupdates) {
        # hide the non-firmware updates since I don't want
        # users tempted to install them
        system "softwareupdate --ignore $otherupdates >/dev/null 2>&1";
    }
}
```

Admin users get one version of the alert. This version opens the Software Update application if he or she clicks **Install**. We embed some AppleScript and use osascript to call it. Note the "giving up after 120" clause to display alert – this causes AppleScript to close the alert after two minutes if the user ignores it.

```
# are we running under an admin account?
my $checkAdmin = `dseditgroup -o checkmember admin`;
if ($checkAdmin =~ /yes/) {
    # user is an admin, prompt them to install
    my $result = `osascript<<EOF
try
    tell application "System Events"
        activate
        display alert "Firmware updates available" message
        "There are firmware updates available for this Mac:" &
        return & "$firmwarelist" as warning buttons {"Later",
        "Install"} default button "Install" cancel button "Later"
        giving up after 120
    end tell
    if button returned of the result is "Install" then
        tell application "Software Update" to activate
    end if
end try
EOF`;
```

If the user is not an administrator, the user gets an alert directing him or her to call the help desk – again we use embedded AppleScript to display the alert.

```
else {
    # user is not an admin, tell them to call help desk
    my $result = `osascript<<EOF
try
    tell application "System Events"
        activate
        display alert "Firmware updates available" message
        "There are firmware updates available for this Mac:" &
        return & "$firmwarelist" & return & "Please call Tech
        Support at 555-1212 for help in installing these
        updates." as warning buttons {"OK"} default button "OK"
end try
EOF`;
```

# If you have a smartphone, we can sync it.



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```

cancel button "OK" giving up after 120
end tell
end try
EOFB`:
}

```

If the script runs in the context of a user without admin rights and firmware updates are available for this machine, after a few seconds, the user will see an alert like the one in Figure 2.



**Figure 2. Firmware alert for non-admins**

If it runs under an admin user's login, the user should see a slightly different alert, as shown in Figure 3.



**Figure 3. Firmware alert for admin users.**

If the admin user clicks **Install**, Software Update will be launched and the admin user can install the firmware update immediately. Non-firmware updates should be hidden, but can be shown again by selecting **Reset Ignored Updates** from the Software Update menu.

If you don't want to retype this script (and who would?) you can find a copy here:

<http://managingosx.wordpress.com/2009/01/06/firmware-updates/>

To get the script to run at login for every user, we'll use a launchd agent. Make a directory called "Management" in the root Library directory (if you have another directory for this sort of thing, feel free to use that instead):

```
mkdir /Library/Management
```

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Save the script as "firmwarecheck.pl" in that directory. Make sure it has execute rights:

```
chmod 755 /Library/Management/firmwarecheck.pl
```

You can check if you did things correctly by trying to run it:

```
/Library/Management/firmwarecheck.pl
```

Now we can create a launchd item to run it at login for every user. Create a plain text file at `/Library/LaunchAgents/com.myorg.firmwarecheck.plist` with this content:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN"
"http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Label</key>
  <string>com.myorg.firmwarecheck</string>
  <key>LimitLoadToSessionType</key>
  <string>Aqua</string>
  <key>Program</key>
  <string>/Library/Management/firmwarecheck.pl</string>
  <key>RunAtLoad</key>
  <true/>
</dict>
</plist>
```

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Some of these launchd keys are new in Leopard, but this launchd item will also work in Tiger. Check to make sure your launchd plist is a valid plist file:

```
cd /Library/LaunchAgents
plutil -lint com.myorg.firmwarecheck.plist
com.myorg.firmwarecheck.plist: OK
```

If you don't get an "OK" message, double-check your typing. Ensure your new launchd item is owned by `root:wheel` and has mode 644:

```
cd /Library/LaunchAgents
sudo chown root:wheel com.myorg.firmwarecheck.plist
sudo chmod 644 com.myorg.firmwarecheck.plist
```

If you made no mistakes, `/Library/Management/firmwarecheck.pl` will now be launched whenever someone logs in. All the pieces are in place! Package up the two files and push them out using your favorite software distribution mechanism.

## End of Pain?

In this month's column, we dealt with the pain of firmware updates in an enterprise environment by pushing the pain throughout the organization. A script that runs at login checks to see if firmware updates are available for the machine. If firmware updates are found, the user is notified. Even if the user chooses to ignore these notifications, the next time an admin user logs into the machine they will also be notified. If you are lucky, you'll have users who will call the help desk, and then you can use Apple Remote Desktop, Leopard Screen Sharing, or another remote access solution to kick off the firmware update, and tell the user to do the "human-needed" part of holding down the power button for those updates that require it. If you're not so lucky, at least you'll know when machines need updates, and the next time you visit the machine and log in as an administrator, you'll be reminded to apply the updates.

Even if this solution doesn't make sense for you or your organization, the techniques presented here could be used to craft other solutions – for this problem and others. As an OS X system administrator, you'll want to be familiar with as many tools as possible. This column touched on `softwareupdate`, Perl scripting, AppleScript, and `launchd`, each important tools in the Mac sysadmin's toolbox!



## About The Author

**Greg Neagle** is a member of the steering committee of the Mac OS X Enterprise Project ([macenterprise.org](http://macenterprise.org)) and is a senior systems engineer at a large animation studio. Greg has been working with the Mac since 1984, and with OS X since its release. He can be reached at [gregneagle@mac.com](mailto:gregneagle@mac.com).

# AGILE MODELING with ConceptDraw® Office



Applying comprehensive Agile project management techniques to real projects, with the help of ConceptDraw Office, you can easily combine project management techniques with comprehensive information visualization in a single toolset. As every development process is unique and must be tailored to the specific project, it is important to remember the following key ideas:

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- UML diagramming defines project direction without dictating how you do it.
- Effective communication enables allocation of time and resources for the effective management of project process.

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The basic components of a User Story are often defined as the three C's. The **Card** is a written identification of what is being built, the **Conversation** contains recorded notes, mockups, drawings, and documents exchanged with the end users, and the **Confirmation** is a description of acceptance test criteria (User Wish). You can explore the User Wish with ConceptDraw MINDMAP. Using a mind map is a very effective way to capture a user's requirement in a visual format.

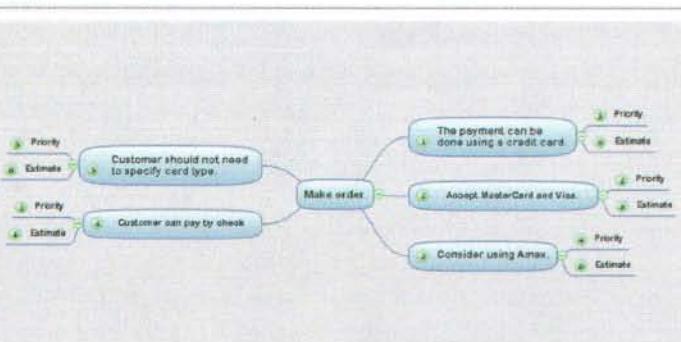


Figure 1. User Wish with ConceptDraw MINDMAP.

With ConceptDraw PRO, you can visually represent project progress with Unified Modeling Language (UML) case diagrams and a UML class diagram, generated from information contained in the User Wishes mind map. You can use MINDMAP and UML to divide user requirements into two stages.

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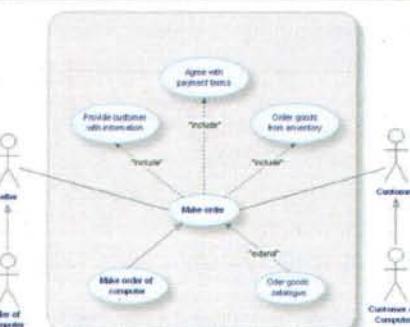


Figure 2. UML Case Diagram with ConceptDraw PRO.

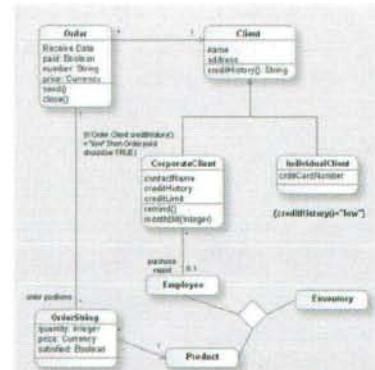


Figure 3. UML Class Diagram with ConceptDraw PRO.

Using UML during the second Requirements Modeling stage you are able to model domain objects and use cases from keywords gathered from the User Wish Exploration mind map.

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# Packagemaker: Delivering Applications

Learn how to build an application installer  
for OS X 10.5

By José R.C. Cruz

## Introduction

In this article, I will show how to deliver applications for Leopard using an installer package. First, I list situations where an installer package is the better delivery solution. Next, I show how to add an application payload to a package. Then I show how to get the package check for certain target settings. I also show how to get the package choose the right payload for the specific target.

The projects files featured in this article are all available from the MacTech source archive (<ftp://ftp.mactech.com>).

## A Survey of Delivery Methods

You can deliver your applications to OS X users in a number of ways. One way is to package the application in a **tarball** or **ZIP archive** (Figure 1). When a user double-clicks the archive, the Finder opens the archive with the Archive Utility tool. It then extracts the application and saves it on the same directory as the archive. The user then moves the application to the desired location.

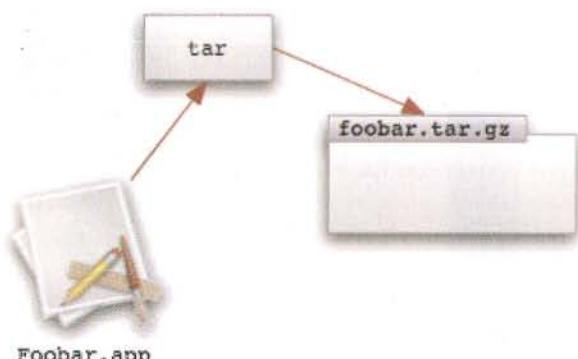


Figure 1. Delivery by tarball

Another way is to package the application in a **disk image file** (Figure 2). When a user double-clicks the file, the Finder mounts it as a virtual disk volume. The user then copies the application from the image to the correct location. You can also place a link to the preferred directory on that image file as a matter of

convenience. You can also have the image file display a *ReadMe* or *License* file while being mounted.

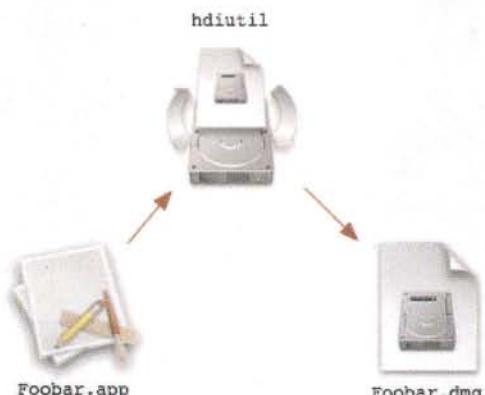


Figure 2. Delivery by disk image

Both methods are *simple and easy to prepare*. They incur *zero costs*, which makes them popular for open-source and freeware projects. But these methods rely on users *knowing* how to install the payloads. They also work best if the payload is a *single application*. A more user-friendly method is to use an **installer package**.

## Delivery by package

Using an installer package as a delivery method has a number of benefits. First, a package can check *if the target can run your application*. For instance, if the target has the wrong system version, the package tells users of the problem, and then stops the install process. But if the target lacks enough memory, a package can warn those users, yet allow the install process to continue.

A package can *install any support files* that the application needs. It can route those files to the right locations on the target. It can use SystemStarter to launch those files if necessary. Or it can prompt users to re-login or restart their machines in order to use the application.

A package can *handle several variants* of the same payload. Assume, for example, you have two variants of the application

**Foobar.** One variant is optimized for PowerPC, the other for x86. The package can first check which CPU the target uses. It then can select and install the right variant for that target.

A package also “forces” users to read important files such as the ReadMe and License files. Users often ignore these files if found in a tarball or disk image. A package also keeps a *record* of the installation in the `/Library/Receipts` directory. It then can use this data to handle any upgrades to the application. And a package can run scripts to prepare the target before and after an install session.

But an installer package also has its own downsides. It takes *more work* to prepare a package than an archive or disk image file. The package is also a *bundle* format, which needs the use of an archive or disk image file (*this is no longer true with Leopard packages*). And there are *variants* of the package format, each variant tuned to a specific version of OS X.

Nevertheless, an installer package is a viable delivery method. Apple itself uses packages to deliver products such as iTunes, iPhoto, and Xcode to its users. These products are prime examples of how an installer package should work.

## The Application Payload

Applications come in two forms. Some are *executable files*. They keep their code and resources in one large file. Some are *executable bundles*. They keep their code and resources as separate items in one special directory.

PackageMaker 3.0 can handle either format. It also has two new panels wherein you can configure your payload. The **Contents** panel lets you set the payload’s permission flags, **UID**, and **GID**. The **Components** panel lets you set the relocation and downgrade options of your payload.

### The Contents panel

The **Contents** panel (Figure 3) lists the items that comprise the application payload. It shows the current permissions, **UID**, and **GID** of each item. By default, PackageMaker shows the **UID** and **GID** that Xcode assigned to the payload and its items. It also shows the octal value 732 as the payload’s permissions.

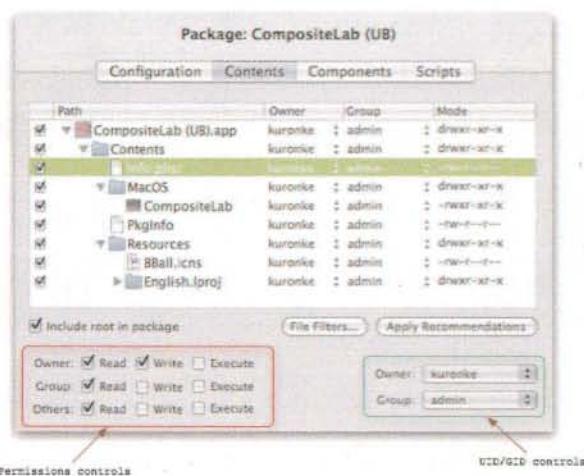


Figure 3. The Contents panel

On the lower left of the panel are the **permission controls** (red). Use these controls to change the permissions of the selected item from the list. For example, to set the file `Info.plist` to *read-only*, first select the file from the list. Then set the checkboxes **Read**, and clear the checkboxes **Write** and **Execute**, for each user type.

Note that changing the permissions of a directory does not change the permissions of its items. Note also that some directories such as `.app` and **Contents** must have the **Execute** flag set. If this flag is not set, the application bundle *will not run*.

On the lower right of the panel are the **UID /GID controls** (green). Use these controls to change the **UID** or **GID** of the selected item. For instance, to change the **UID** for `Info.plist` to `root`, select the file from the list. Then choose `root` from the pop-up menu **Owner**. Again, changing the **UID** or **GID** of a directory does not affect its items.

In most cases, you should let the tool assign the correct permissions, **UID**, and **GID** to the payload’s items. To do so, click the button **Apply Recommendations**. The tool then updates each item in the payload to the correct set of permissions. It also sets the **UID** and **GID** to `root` and `admin` respectively.

You can also use the **Contents** panel to exclude certain items in the payload from the package. For example, to exclude the `French.lproj` bundle, clear the checkbox *next to that bundle’s name* (Figure 4). When the tool builds the installer package, it does not add `French.lproj` and its files to that package.

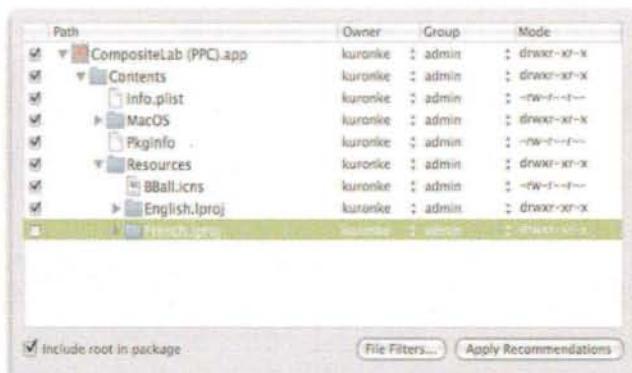


Figure 4. Selecting an item to exclude

Another way to exclude items is with the **File Filter** dialog (Figure 5). This dialog lists the *regex patterns* the tool uses to check each item. If the tool finds a matching item, it excludes that item from the package. Those same items will still appear on the list, with their checkboxes set.

To *add a pattern* to the list, click the '+' button. Then type the string directly on the list. To *remove a pattern*, select the string from the list, and click the '-' button. To *change a pattern*, double-click the pattern string on the list. Make sure to click the **Save** button to keep your changes.



Figure 5. The File Filter dialog

## The Components panel

The Components panel (Figure 6) defines how the package handles **relocation** and **downgrades**. By default, the package installs its payload at the path set in the **Destination** field. To let users to change the path, select the checkbox **Allow Relocation**. Users can then use the **Select A Destination** panel to select a new destination for the payload.

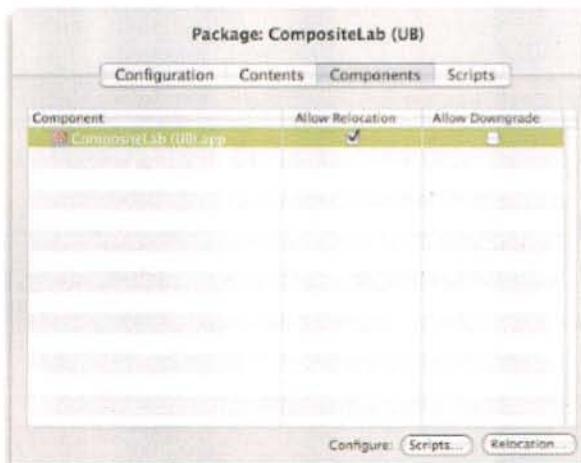


Figure 6. The Components panel

Also, by default, the package only lets users to do upgrades. If the target has a copy of the payload, the package will replace that copy only with a newer version. To let users install an older version of the payload, set the checkbox **Allow Downgrade**.

The topics of relocation and downgrades are beyond the scope of this article. I will, however, cover these two

topics in a future article. For now, just leave this panel at its default settings.

## Preparing The Package

Our demo package **Foobar** will have two variants of the payload **CompositeLab**. One variant is for PowerPC targets, the other for Intel targets. The package will check if the target system is version 10.4.4 or newer. It will filter out all target volumes with less than 1 Gbytes of space. It will also warn users if the target has less than 700 Mbytes of physical memory. To keep things simple, we will leave the package's interface elements at their default values.

Start a new project file with PackageMaker. Choose **Install Properties** from the **Project** menu. Set the properties dialog as shown in Figure 7. This sets the package's base ID. We're using **com.mactech**, but feel free to use your own ID.

The dialog also sets the package format *based on the minimum target system*. If you choose 10.4, the tool will use the **distribution package** format. This is a bundle format. It stores its localized text, metadata, and scripts in the XML file **distribution.dist**. It also stores each payload as separate component packages. But like all bundle formats, you must use a tarball or image file to send the package to your users.

Now if you choose 10.5, the tool will use the new Leopard package format. Unlike previous formats, which are bundles, the Leopard format is a *flat file*. It is simpler to distribute, as it removes the need for a tarball or disk image file. It does not, however, let you change the package *after building it*. It is also supported only on MacOS X 10.5.

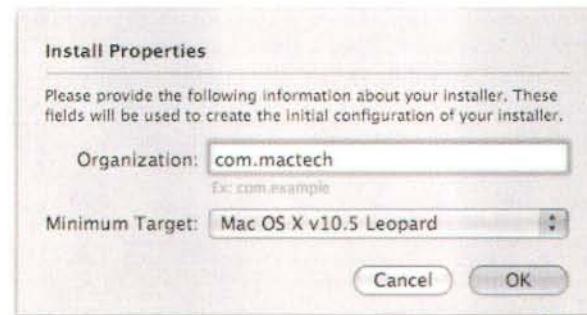


Figure 7. Setting the Install Properties

Next, click the icon **Foobar** at the top of the payload list. Select the **Configuration** tab to display the editor subpanel. Update the subpanel as shown in Figure 8. The settings tell the package to display only the **Custom Install** panel. It also tells the package to let users choose the desired target volume.

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Figure 8. Configuring the package

## Adding the payloads

Choose **Add Contents** from the Project menu. Select the application **Composite (PPC).app** with the sheet dialog, and click the **Choose** button. PackageMaker then adds an entry for that payload in the payload list. It also updates its Configuration panel as shown in Figure 9. Use the same steps to select the application **Composite (x86).app**.

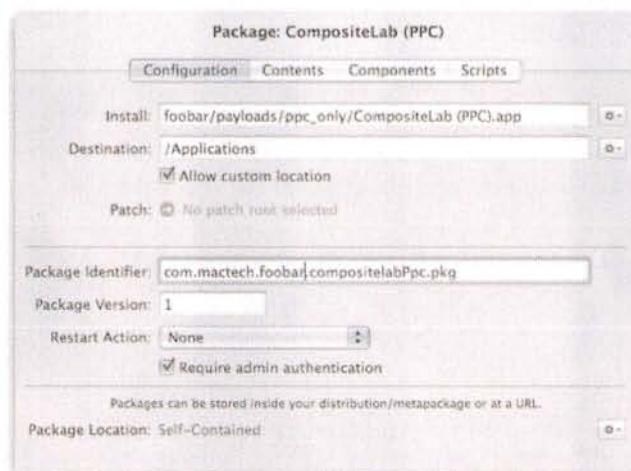


Figure 9. Configuring the payload

Notice the tool sets the destination path for both payloads to **/Applications**. The tool also sets the checkbox **Allow custom location**. It sets the pop-up menu **Restart Action** to **None**, and selects the checkbox **Require admin authentication**.

## Configuring the contents

Select the payload **CompositeLab (PPC)** from the payload list. Click the **Contents** tab on the editor panel. You should see the payload bundle displayed on the **Contents** list. To view the bundle's items, click the *triangle* next to its name (Figure 10).

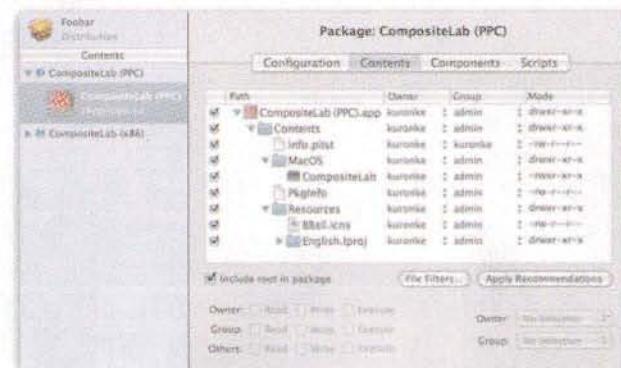


Figure 10. Configuring the payload contents

As stated earlier, PackageMaker sets the **UID** and **GID** of each item to *your username and group*. Now click the button **Apply Recommendations**. The tool will change the **UID** and **GID** to **root** and **admin**. Apple uses these same settings for its Cocoa products.

Locate and select the file **BBalls.icns** from the **Contents** list. Using the permission controls, set that file as **read-only** for all users, you included. Repeat the same steps for the file **Info.plist**. Leave the permissions for the rest of the bundle items unchanged.

Now, select the payload **CompositeLab (x86)** from the payload list. Use the same steps to configure the bundle contents of that payload.

## Setting target requirements.

Now, click the **Foobar** icon at the top of the payload list. Select the **Requirements** tab on the editor panel. Then click the **‘+’** button at the bottom left of the list to display the **Requirements Editor**.

Update the editor as shown in Figure 11. Click the **OK** button to save your settings. These settings tell the package to check if the target OS is *at least version 10.4.4*. If the check proves true, the package continues the install session. If false, it displays the failure message and *ends the session*.

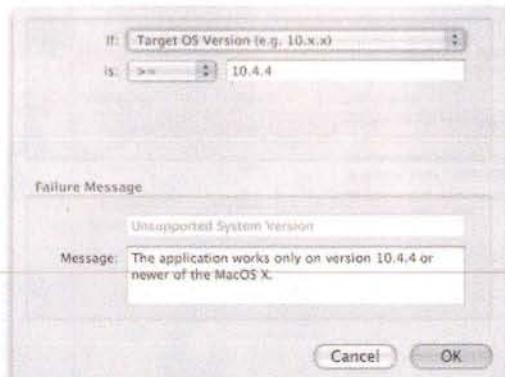


Figure 11. Checking for OS version

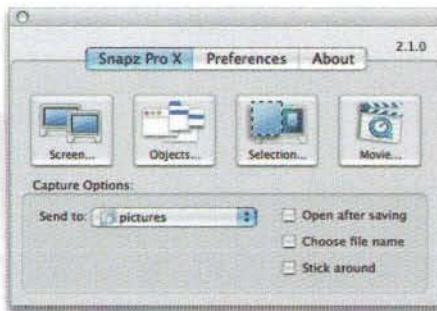


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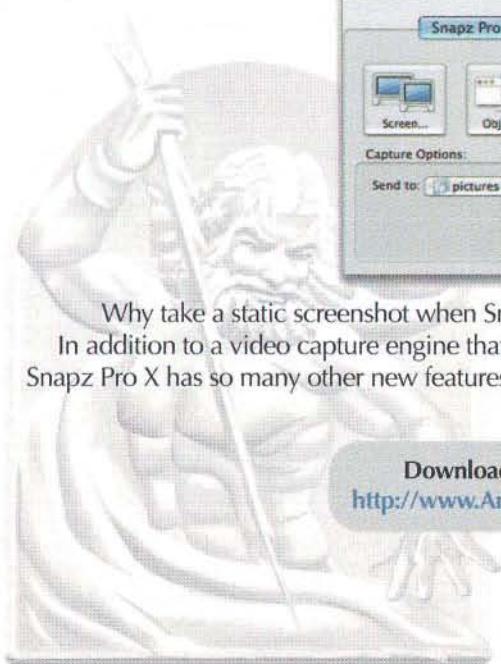


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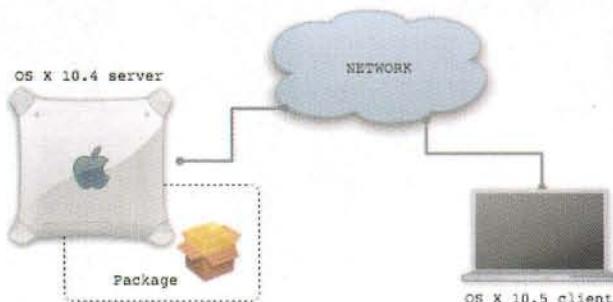
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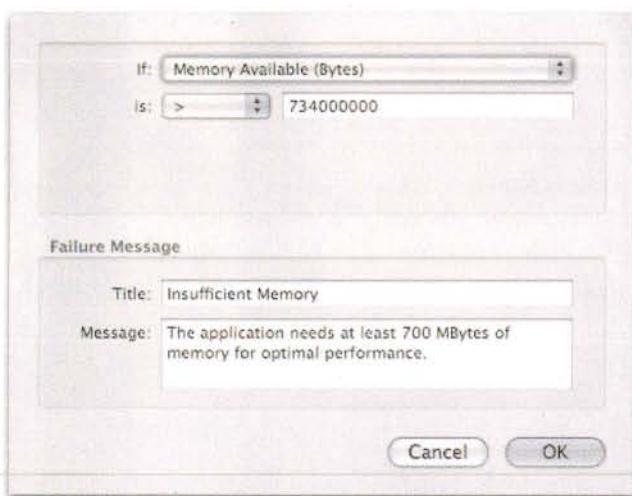
Notice that there are actually two checks for OS versions. One checks the *system version*, the other the *target version*. **System** is where you are *hosting* the package. It is where you opened the package using Installer. **Target** is where you want to *install* the payload. It also has the volumes that may contain the payload.

In most cases, system and target refer to the *same thing*. This is the assumption I make in this article. But there are cases when system and target are not the same. Figure 12 is one example of such case. Here, the package is on a server running OS X 10.4. It installs its payload onto a network client running OS X 10.5. So, in this example, the 10.4 server is the system and the 10.5 client is the target.



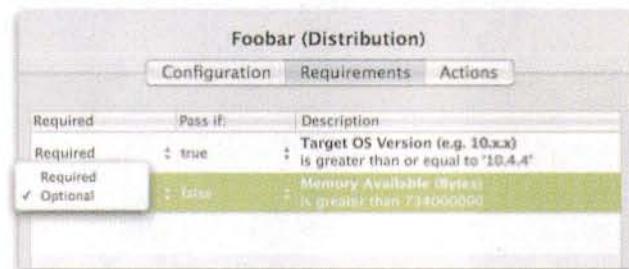
**Figure 12. Delivery via a network**

Time to add the memory check. Click the '+' button to display the Requirements Editor. Update the editor as shown in Figure 13. Click the **OK** button to save your settings. These settings tell the package to check if the target has *at least* 700 Mbytes of physical memory. If the check proved false, the package displays the failure message. Notice that the memory amount is expressed in *bytes*.



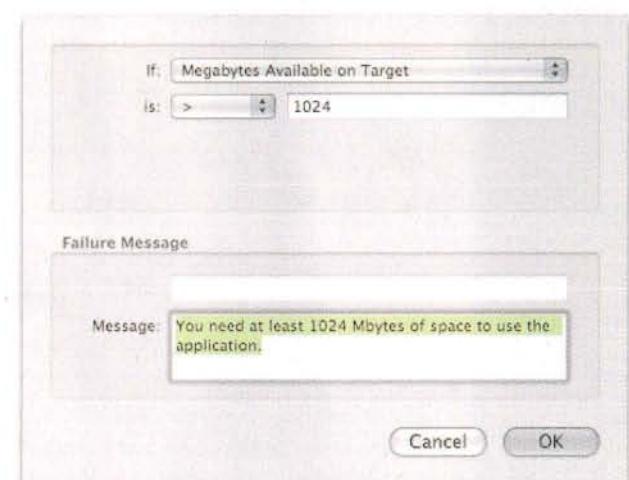
**Figure 13. Checking for physical memory**

Unlike the OS version check, the memory check *only checks the system*. But like the OS version check, the memory check also ends the session if it is false. To change this behavior, select its entry on the Requirements list. Click the **Required** column, and change the entry from **Required** to **Optional** (Figure 14). Now, when the check proved false, it will still let users continue with the install session.



**Figure 14. Making the check optional**

Bring up the Requirements Editor once again. This time, update the editor as shown in Figure 15. Click the **OK** button to save the settings. These settings tell the package to check each *mounted volume on the target*. If it finds a volume with less than 700 Mbytes of free space, the package *will not install* its payload on that volume. It will also display the specified failure message for that volume.



**Figure 15. Checking for volume space**

The package runs each check at different points in the install session. It runs the check for the target's OS version and memory right after it shows its **Welcome** panel. But it runs the volume check after it shows the **Select A Destination** panel. Knowing where each check is done will help debug any problems found in the package.

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## Configuring the choices

The next step is to configure each payload choice. Click the choice **CompositeLab (PPC)** from the payload list. Select the **Configuration** tab on the editor panel. Update the panel as shown in Figure 16. These settings enable and select the choice by default. They also set the description and tooltip message of this choice.

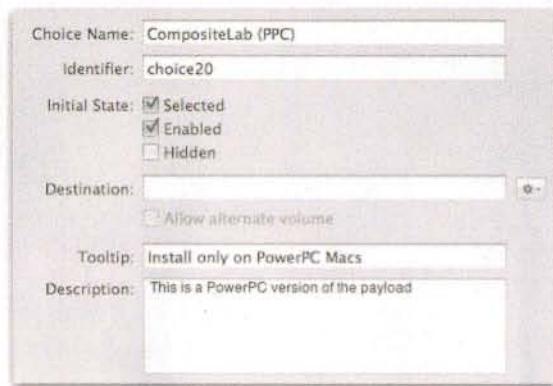


Figure 16. Configuring the PowerPC payload

Now select the **Requirements** tab from the editor panel. Click the '+' button to display the Requirements Editor. Then update the editor as shown in Figure 17. These settings tell the package to check the system CPU using a **sysctl()** call. If the CPU is a PowerPC, the package leaves the choice unchanged. Otherwise, it deselects and disables the choice.

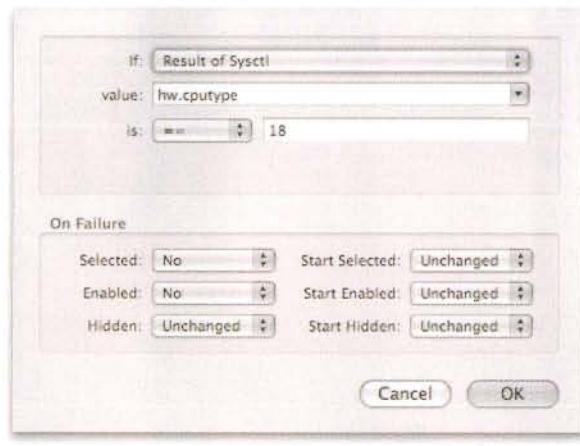


Figure 17. Checking for a PowerPC CPU

Next, click the payload choice **CompositeLab (x86)**. Update its **Configuration** subpanel as shown in Figure 18. Again, the settings select and enable this choice by default.

They also set the description and tooltip message of this choice.

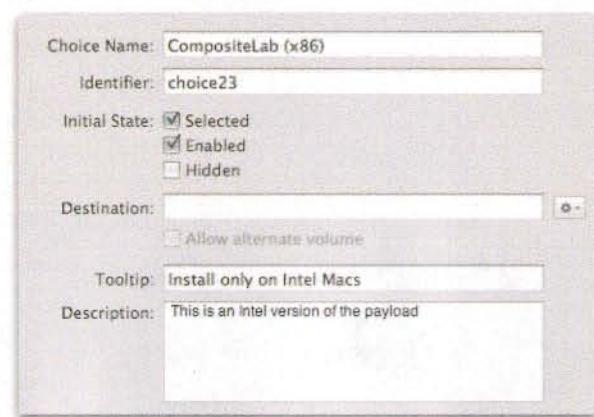


Figure 18. Configuring the x86 payload

Go to the **Requirements** subpanel and display its editor. Update the editor as shown in Figure 19. Again, the settings tell the package to check the system CPU using a **sysctl()** call. If the CPU is an x86 or Intel processor, the package leaves the choice unchanged. Otherwise, it deselects and disables the choice.

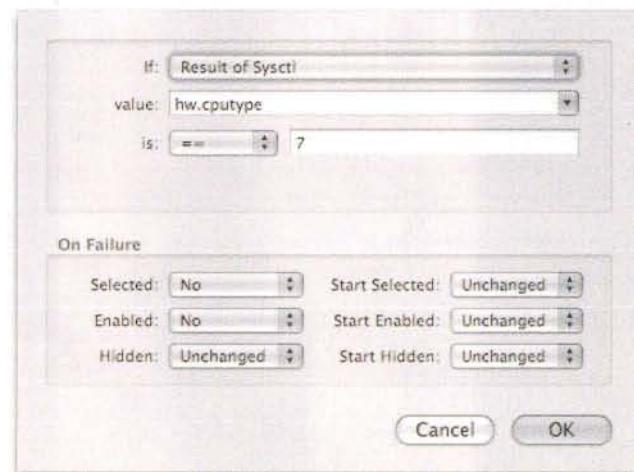


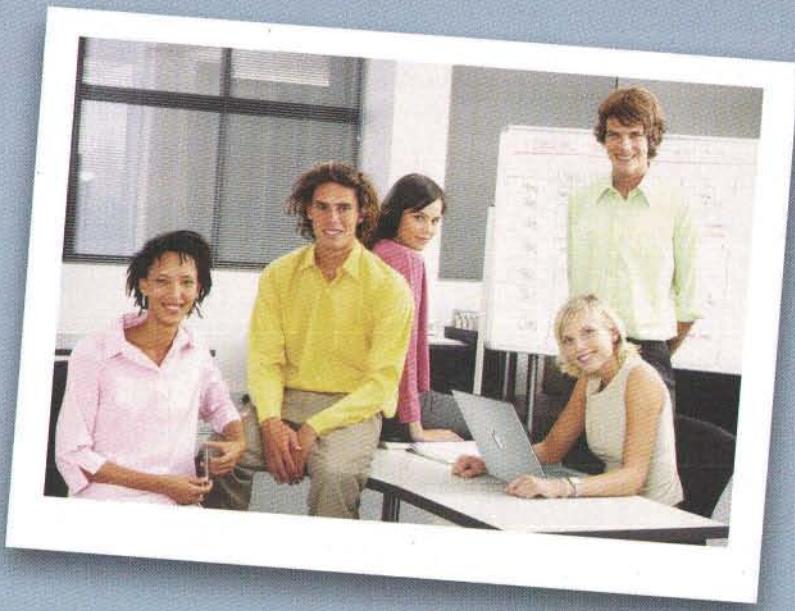
Figure 19. Checking for an x86 CPU

## Testing The Package

I will now show how to test your package. First, choose **Build** from the **Project** menu. PackageMaker then prompts you for a package name. Type **Foobar** on the **Save File** dialog and click the **Save** button.

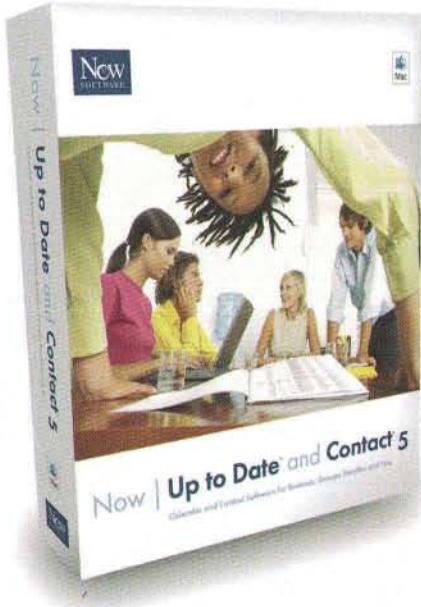
Then go to the Finder and locate the **Foobar** package. Double-click the package to start an install session. If all goes well, the package should display its **Welcome** panel.

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## Testing requirements

After the package displays its **Welcome** panel, it first runs the OS version check. If your target is running 10.5, it should pass the OS version check. But if it is running 10.4.3 or older, you should get the error dialog in Figure 20. Clicking the **Close** button should end the install session. If these do not happen, recheck your requirements settings and rebuild the package.

The OS version check, however, does not apply if the package uses the new flat file format. Again, this is because only 10.5 will support the new format.

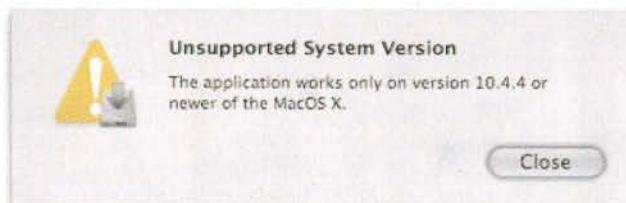


Figure 20. The OS version check fails

Once the target passes the OS version check, the package then runs the memory check. If the target has less than 700 Mbytes of memory, the package should display the warning dialog in Figure 21. But clicking the **OK** button should not end the install session. Instead, it should dismiss the dialog and return you to the **Welcome** panel.

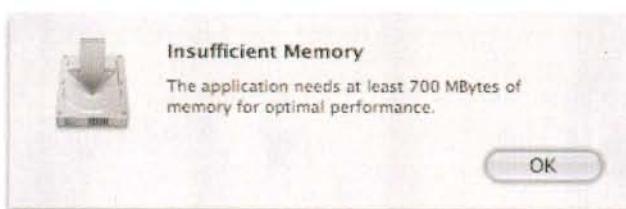


Figure 21. The memory check has failed

Now, click the **Continue** button on the **Welcome** panel. The package then displays the **Select A Destination** panel (Figure 22), showing a list of target volumes. It then runs the volume check on each mounted volume. If a volume fails the check, its icon gets a *stop badge*. Selecting that volume will display the error message. But if a volume passes the check, selecting that volume displays a *green arrow* on its icon (Figure 23). And, placing the cursor over any volume icon, pass or fail, displays that volume's *mount info*.

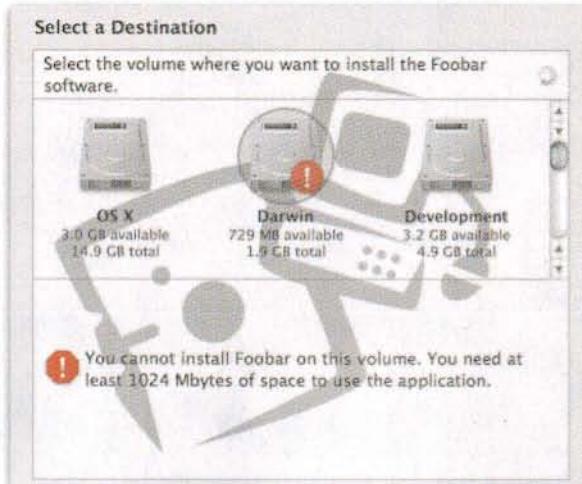


Figure 22. Selecting a volume that failed the check

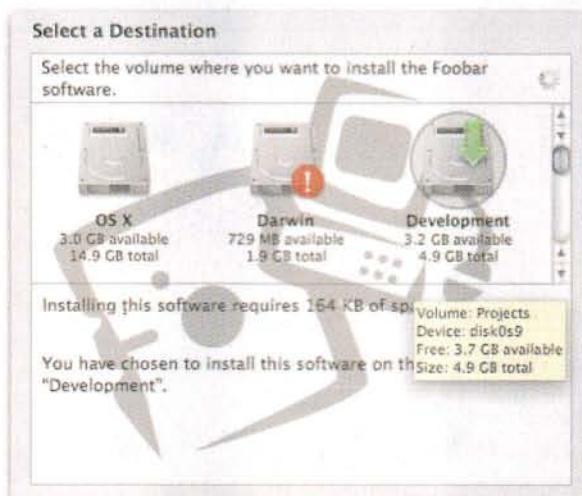


Figure 23. Selecting a volume that passed the check

## Testing choices

After you have selected a target volume, click the **Continue** button to go to the **Custom Install** panel. If the package does not display this panel, you may have disabled this setting. Make sure you have configured your package as shown in Figure 8.

On a PowerPC target, the package should enable and selected the payload **CompositeLab (PPC)**. It should also disable the payload **CompositeLab (x86)** as shown in Figure 24. The reverse should happen if the target is an Intel one. Also, if you select either choice, you should see its description displayed on the field below the choice list. And if you place the arrow cursor over each choice, you should see the tooltip message for that choice.

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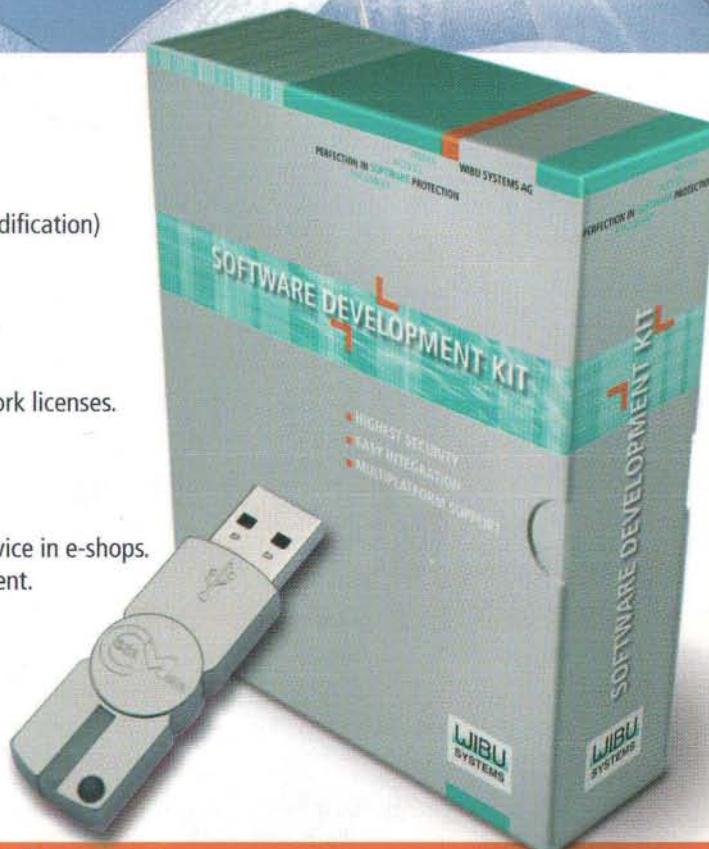
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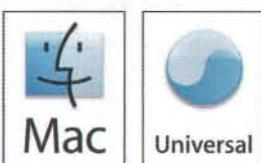
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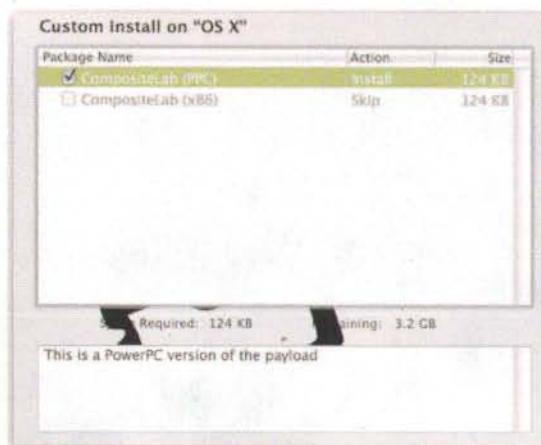
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Fax: 1.206.237.2644



**Figure 24. Choosing the PowerPC payload**

If none of these happen, check again your settings for that choice. You may also want to check the target to see if it returns a different `sysctl1()` value. Start a Terminal session and type the following at the prompt.

`sysctl hw.cputype`

If the target returns a value different from 18 or 7, use that value to enable the right payload.

### Testing payloads

Once you confirmed the right payload selected, click the **Continue** button to display the **Standard Install** panel. Then click the **Install** button to install the payload.

First, the package asks you to enter an *admin password*. Enter the password and click the **OK** button. If the password is correct, the package then installs its payload onto the target volume. It then displays the **Conclusion** panel shown in Figure 25.

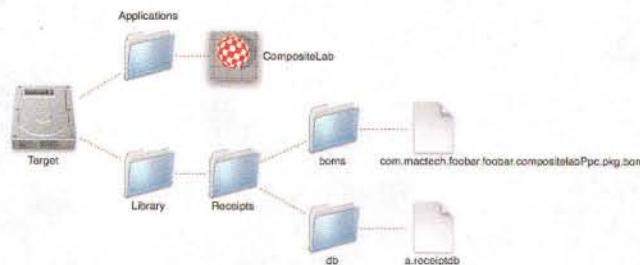


**Figure 25. The concluding panel**

If you enter the wrong password thrice, the package should return you to the **Standard Install** panel. Also, if the package fails to install its package, it should display a *red circle with a white cross* on its **Conclusions** panel.

Now, check the target volume that you have selected. You should find the payload inside an **Applications** directory. You should also find a **/Library/Receipts** directory at the volume's

top level. That directory's contents should be the files shown in Figure 26. These files serve as a record of your install session.



**Figure 26. The results of the installation**

If you find these items installed on the target, your install session is indeed successful.

### Concluding Remarks

This article showed some of the benefits of using an installer package to deliver applications. The package can install the right payload for a given target. It can check the target for resources needed by the payload. It can set the correct permissions, **UID**, and **GID** to the payload. It also makes a record of the install session on the target.

Next time, I will cover the new scripting features of PackageMaker 3.0. I will show how to add an installer script to the package. I will also show how to write and edit a script using the **Requirements Editor**.

Until next time, relax and have a cup of tea.

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### About The Author

**JC** is a freelance engineering writer from North Vancouver, British Columbia. He spends his time writing technical articles; tinkering with Cocoa, REALbasic, and Python; and visiting his foster nephew. He can be reached at [anarakisware@gmail.com](mailto:anarakisware@gmail.com).

# personals

Like ships  
passing in  
the night

**VEGETARIAN BOWLER.** You bought me a warm beer and stole my heart. Used same kind of ball and spoke of hatred of rented shoes. Would love to chat over hummus. #6848.

**LAWN CARE?** My husband got lazy and hired you to mow our lawn. Instead you landscaped my erotic fantasies in ways I have never imagined. Could not pronounce your name but looked very sensual. I had blue shoes on. #3696.

**TWINS WHO SAW TWINS.** Us: two handsome guys in suspenders walking Maltese. You: two foxy ladies fighting over last piece of gum. What do you say the four of us make: two good looking couples? Twin love. Call me. Call me. #4747.

**DUGOUT FIRECRACKER.** You were cleaning up a beer that you spilled on your white t-shirt and threw a whiskey bottle at the umpire. Must meet you and make children. #5551.

**DAVID, YOU'RE GORGEOUS.** Funny and brilliant. I don't deserve you but a girl can dream. #6895

**BEAUTIFUL AND SEVENTEEN:** Met you at the Metro. You were on a date with someone else. Next time it will be me. #6823.

**LEVITATING BUDDHA SWORD-**

**PLAY** welding lady. I'm interested but your brave new world expired. Call me. #7222.

**WOMEN, COME LOVE DANCING**

**GP: YOU'RE SPOCK** to my Captain Kirk. Love you in those vanity-sized jeans! Let's watch Oprah together. Call me. #6841

**GORGEOUS, WITTY, BORN TO** tease: love theater, dance, golf, warm conversation. If you're tall, 35-55, non-smoker, financially secure, enjoys pampering a woman traveling, long walks and stars please call. #3851

**ME: LONELY SWEDISH LINGERIE MODEL** and gourmet cook. You: slightly overweight and without ambition. Must be into computers, role-playing games and air hockey. #5988

**49, PLAIN BUT WITH GOOD BITS** overweight but curvy, great mind, wicked sense of humor, and a weird view of life looking for like minded person. Age not important. #6994

**TREE HUGGER, MID 50'S,** light smoker, tall. Like easy living, tropics and I'm friendly. Seeking considerate, semi-fit companion with a clue. Must love dogs and reggae. #6903

**ARE YOU HONEST,** handsome, successful, financially secure, intelligent, world traveled, cultured, creative, fit, playful, adventurous, passionate, humorous, caring, loving, and between 40 and 58? Respond to European blonde female computer nerd. #6852

**30, ATTRACTIVE**

**ARE YOU STIMULATED BY** beauty, intelligence, humor? Attractive SWF wants good looking SWM or SHM for romantic adventures, possible long term. Essentials: honesty, passion, kindness, sensuality, integrity, open mind. #6741

**ATTRACTIVE TALL (5'10")**, slender DPWF, 46, emotionally and physically fit, youthful appearance and outlook, intelligent, loving, desires love and relaxation. #6853

**YOU WON'T BELIEVE YOUR EYES** when you see this very cute, petite, DWF, 46; long brown hair/hazel eyes, 5'110, outgoing personality seeks DWN, 46-55, non-smoker, fit, college educated. Call me, let's see if the chemistry is right! #6851

**SWF, 26, STRAWBERRY CURLS** and tattoos. Craving a complete, enlightened, educated, thoughtful, caring, kind, non-smoker. #6874

**NOT SO DESPERATELY** seeking one smart, strange, sexy boy to court and spark. Me: 23, open to possibilities and ravenous for new life experiences. #6933

**SWINGING SANTA.** Lonely man who only works 6 weeks a year seeking woman with full time employment with benefits looking to grow old with man who shakes like a bowl full of jelly. #1258

**WM, 95, RECENTLY WIDOWED,** seeking 18-20 hottie for "fun". Call soon, I'm not getting any younger. I'll put you in my will. #6757

**BALD HOMEO.** You serenaded the old people at the old people home last weekend. You were a terrible singer and quite unattractive, but your heart is obviously pure gold. My sister would be perfect for you. #8887

**MONKEY TRAINER.** Seeking woman to train my monkey. Seriously, his name is Murphy and he is a 3 year old chimpanzee. He likes pop tarts and nice people. Plus, you and I will have sex. #7874

**SINGLE MAN.** Single man seeking single woman for relationship. I enjoy dating and talking on the phone to women that I am dating. Would love a chance to date someone. #1254

**CUTIE PIE SMARTY-PANTS** an dit seems arty but he's straightforward. Being single, my world is who the hell I am. #6837

**SIDESHE**  
sideshe  
well I  
for  
or  
ar  
F  
T  
H  
ing  
light  
do you  
good to  
Call me

**MANY WON**  
my life - but no  
wonderful woman  
smart, professional, an  
(non-smoker). Love of nature  
irreverent humor. #6772

**RECENTLY PAROLED,** looking for a lady who will keep me on the straight and narrow. Must be into drugs and shoplifting. #6307

**HOPELESS ROMANTIC,** backs  
my head to your back  
big smile, big smile

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## Supporting Entourage with Exchange

“Be prepared!” or, “What administrators need to know about installing, deploying, and maintaining Microsoft’s Mac mail solution”

by William Smith

### An end-to-end solution

E-mail is the hub of business and Microsoft Exchange Server is the hub of E-mail for most large organizations and many educational institutions. While just about any E-mail application for Macintosh can connect to Exchange for mail, only Microsoft Entourage supports the majority of services Exchange provides.

Entourage, when connected to an Exchange Server, is an end-to-end solution providing Mac users access to their mail, calendars, contacts and more. Like Microsoft Office, Entourage is itself a suite of different applications that can work independently but become more productive when used together.

Connecting Entourage to Exchange can be confusing for end-users who are not technically inclined and supporting many of these end-users can indeed be an administrative challenge. This article will attempt to explain your options for providing Exchange support for your Mac folks using Entourage, even if your organization isn’t currently running Exchange. While Mac OS X 10.6 (Snow Leopard) is reported to offer Exchange support when it is released, it is currently in beta and information about it is under non-disclosure agreement.

### What does Exchange offer your organization?

No one E-mail system is meant for everyone and money is a factor as well as support. Exchange isn’t free like Postfix or Sendmail. It’s also not simple to configure and set up for service like Mac OS X Server’s Mail Services. Why would your organization want to consider using Exchange if it’s not already doing so?

Exchange is meant for collaboration—it’s meant to be used by people who need to work with each other. It’s certainly not the only server solution for sharing calendars and address books but it is one of the most mature and full-featured systems available. Exchange is designed to integrate with existing Windows network systems such as Active Directory, which serves as the backend to a company address list, and Office

Communications Server, which is Microsoft’s instant messaging system.

Any mail client will work with Exchange. While it offers more complete support for Outlook for Windows and Entourage for Macintosh, it’s also made to work with any mail client that supports standard POP and IMAP; Microsoft clients aren’t required. However, Exchange’s hallmark in today’s on-the-go society, is its support for mobile devices using ActiveSync technology. ActiveSync enables Exchange to communicate with Internet-enabled smart phones, such as the iPhone, to push mail and other information across their wireless providers’ networks.



Figure 1: Exchange Services

### Options for smaller organizations

All of this takes a sizable investment in infrastructure, which is a huge disadvantage to smaller companies, but they have options too. Any individual, any small company or any

organization with limited resources can still get access to Exchange.

For individuals and small organizations without a server budget, online service providers offer Exchange Server services over the Internet. This is known as "hosted Exchange". An office of three users can find online hosting deals for about \$35.00 per month. This usually includes 24/7 support, spam filtering and access to Outlook Web Access (OWA), which is webmail that is accessible via a web browser. These accounts usually include free Microsoft E-mail software, Outlook for Windows and Entourage for Macintosh, but be sure that any service provider you choose says it will support Macs at the Help Desk and not just on their website. Mobile phone and Blackberry services will be extra.

For those larger organizations where IT has been brought in-house and is supported either full-time or part-time, then Microsoft Small Business Server (SBS) may fill their needs. SBS is an all-in-one Windows Server product that offers not only file and printer sharing but Exchange, remote connectivity and SharePoint. Full Exchange services are provided with SBS, however, enterprise-level options like secondary mail servers aren't available. This product really is intended for "small business".

Exchange Server can be virtualized. Mac shops that want the feature set of Exchange but want to utilize their existing XServer infrastructure may want to consider running Exchange on VMWare Server or Parallels Server. A newer Intel XServer with beefy amounts of RAM and processing power can run multiple Mac OS X and Windows virtual machines. This is also an excellent way to evaluate the trial version of Exchange Server 2007.

Educational institutions may be interested in Exchange Labs offered directly from Microsoft. This service is provided through Windows Live and offers hosted Exchange mail services for schools interested in piloting or deploying Exchange.

## Deploying Entourage for your users

Supporting dozens, hundreds or thousands of Entourage users can be a challenge for Mac administrators. Their role is to give their users the best possible experience so that they can do their jobs while keeping costs under control and Help Desk calls at a minimum. Fortunately, they have many tools available to do just that.

### How to get Entourage

Exchange Server 2003's licensing allowed everyone who had a licensed account to be able to use either Outlook 2003 for Windows or Entourage 2004 for Macintosh for free. The client license was included. However, Exchange Server 2007 no longer includes clients with its account licenses. That means organizations moving to Exchange Server 2007 may incur extra costs for each workstation if they're not already running the Office for Mac suite.

Entourage 2008 is not sold separately—it is sold only as part of Office 2008—and Exchange support in Entourage is only available with the premium versions of Office: Standard and Special Media Edition. Universities that have adopted Exchange

Server for their students either need to work with their Microsoft representative to provide stand-alone versions of Entourage or make sure their students are aware that they cannot use the Home & Student version with their school accounts. Students who are responsible for their own software much purchase the "business" class version of Office for Mac.

Hosted Exchange services may provide a stand-alone version of Entourage 2008 for their customers at no charge; however, Microsoft does not support installing it on a machine with the Home & Student version of Office. This makes sense. Exchange is a business-class product but Home & Student is not licensed for business. Use of the Home & Student version for business purposes is a violation of the End User License Agreement. If you don't receive Entourage as part of your Exchange agreement then you must purchase Office Standard or Special Media Edition.

### Installing Apple packages

Office 2008 comes as a single Apple Installer .mpkg package. Apple Installer is scriptable and that means deploying Office for Mac can be scripted too. A basic script would call the `installer` command line tool, telling it simply the name and path to the package, where it's located and where to install it. Assuming the `Office Installer.mpkg` file is still on its DVD, the command to install it would simply be:

```
sudo installer -package "/Volumes/Microsoft Office 2008/Office Installer.mpkg" -target /
```

The `-package` switch denotes the package name, which conveniently includes its path, and the `-target` switch directs `installer` to install onto the current startup volume.

To customize an install—for example installing only Microsoft Entourage, eliminating unwanted proofing languages or preventing application icons from being placed in the Dock—create a simple answer file that can be used with the package. Answer files are the ideal choice for customizing installation because they don't require modifying the original package. Different answer files can be applied for different users' needs.

To create the answer file, paste the following into a plain text editor such as `TextEdit` or `BBEdit`:

### Listing 1: Office Installer.mpkg choices

```
<array>
  <string>word</string>
  <string>excel</string>
  <string>powerpoint</string>
  <string>entourage</string>
  <string>messenger</string>
  <string>proofing-tools</string>
    <string>danish</string>
    <string>dutch</string>
    <string>finnish</string>
    <string>french</string>
    <string>german</string>
    <string>italian</string>
    <string>japanese</string>
    <string>norwegian</string>
    <string>portuguese</string>
```

```

<string>brazilian</string>
<string>spanish</string>
<string>swedish</string>
<string>fonts</string>
<string>automator</string>
<string>dock</string>
</array>

```

Anyone familiar with creating a choices file for AFP548.com's InstaDMG may recognize this format. Each item between `<string>` and `</string>` corresponds with a choice that can be selected when installing Office manually. Compare the options above with the choices in the figure below.



Figure 2: Office 2008 for Mac options

By default, all installable options are enabled. All applications will be installed along with all proofing languages, fonts, Automator Actions and Dock icons. To disable or "uncheck" an option, *include* it in the answer file. If a string is included more than once in the file then the result is like toggling the option off and on again. Therefore, to install all applications, English proofing tools only and Automator Actions, the answer file would look like this:

### Listing 2: Office Installer choices example

```

<array>
  <string>proofing-tools</string>
    <string>english</string>
    <string>dock</string>
</array>

```

Because Word, Excel, PowerPoint, Entourage and Messenger are selected by default, they can be *excluded* from the answer file. The Proofing Tools option and all its sub-options will be unchecked by *including* the `proofing-tools` string in the answer file. To install just the English proofing tools, the `english` string is included *below* the `proofing-tools` string. It is getting re-enabled. Fonts and Automator Actions will be installed but the Dock icons will not.

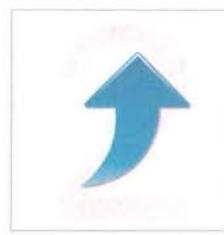
Save this plain text file with a name like `Office2008.answer` and deploy it with the `Office Installer.mpkg` package. Copying it into the `/tmp` folder is a good idea so that it is automatically deleted the next time the Mac is restarted. To apply the file during installation will require just a slight modification of the command line above:

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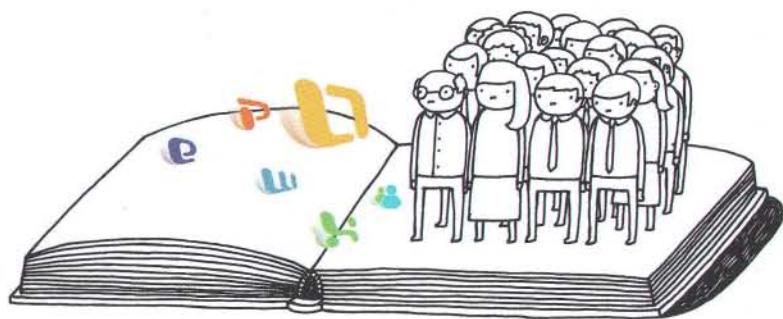
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**Office**<sup>Microsoft</sup>:mac<sup>2008</sup>

```
sudo installer -applyChoiceChangesXML /tmp/Office2008.answer
-package "/Volumes/Microsoft Office 2008/Office
Installer.mpkg" -target /
```

To verify the installation ran according to plan, check that the Microsoft Office 2008 folder and its contents exist in the /Applications folder, verify the Dock has no Office icons and check the Get Info window of any of the applications to examine installed languages.



Figure 3: Entourage Get Info window

## Deployment

Deployment can be as simple as copying the Office installer package to a network file share along with your answer file and then visiting machines, one by one, to install. That may be feasible for a group of 10 Macs or less but doesn't scale well for larger numbers. Mac OS X has a myriad of deployment tools available, ranging from open source products such as InstaDMG and Radmind to commercial products like Apple Remote Desktop (ARD) and The Casper Suite.

While these tools differ in their methods for deployment, they all have similar approaches: scripted installs to multiple machines. Again, Office 2008's Installer package lends itself very well to scripted installs and most of these deployment tools are ready to accept Installer packages without much, if any, need for modification.

## Patch management

Patch management for Office 2008 also lends itself to scripted installs because the Macintosh Business Unit (MacBU) at Microsoft has taken a new approach to its patch management strategy. Rather than releasing multiple delta updates that each depend on a prior update to be installed, MacBU is now releasing mini-combo updates that greatly reduce the number of packages needed to install Office and bring it up to date. To date, only one or two updates need to be applied to an original install to have a fully patched set of applications..

When first released to the public, Office 2008's version number was 12.0.0. MacBU has since released updates 12.0.1, 12.1.0 (Service Pack 1), 12.1.1, 12.1.2, 12.1.3, 12.1.4 and 12.1.5.

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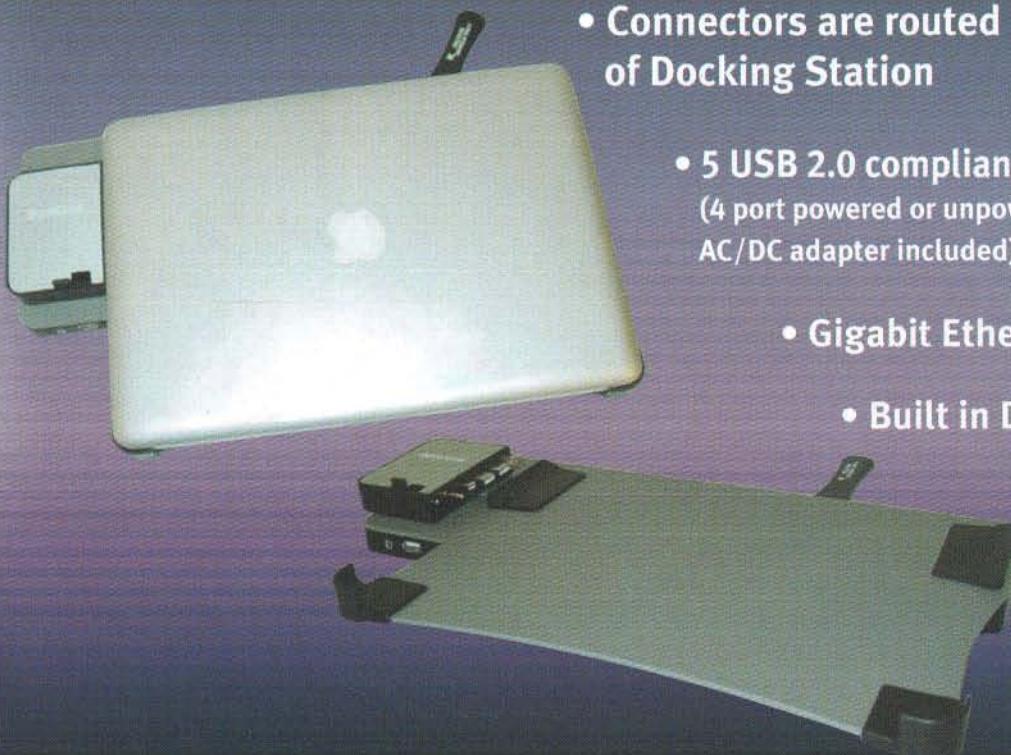


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Additionally, when SP1 was released, MacBU also updated their DVD installers. Microsoft volume licensing customers should be able to request a 12.1.0 DVD to replace their 12.0.0 DVD or download it directly from Microsoft's volume licensing website. That 12.1.0 installer plus one more update will fully patch Office 2008.

Assuming that we're using ARD to deploy and patch Office 2008, we would need to copy the following three installer packages to a common location such as /tmp on every Mac:

- **Office Installer.mpkg**
- **Office 2008 12.1.0 Update.mpkg (not necessary if using a 12.1.0 Office DVD)**
- **Office 2008 12.1.5 Update.mpkg**

Plus we'd want to modify the installer script above to include the updates. To run multiple commands in ARD we'd just type the following into a **Send Unix Command** window:

```
installer -applyChoiceChangesXML /tmp/Office2008.answer -  
package "/tmp/Office Installer.mpkg" -target /  
  
installer -package "/tmp/Office 2008 12.1.0 Update.mpkg" -  
target /  
  
installer -package "/tmp/Office 2008 12.1.5 Update.mpkg"  
-target /
```

This would install our required applications and completely patch Office 2008 in one session. For detailed information about deploying Office be sure to visit Microsoft's Mactopia IT Pros website

## Volume licensing

So far, Office 2008 has been installed but it may not have yet been serialized. To avoid hassles with assigning and tracking serial numbers across multiple machines, administrators should contact their Microsoft representatives for a volume license version of Office for Mac. These licenses are available to organizations with five or more computers.

A volume license version will include an embedded serial number specific to the organization and will eliminate the need for tracking serial numbers across machines. Otherwise, administrators will need to visit each Mac and enter a specific serial number. Entering the same number twice on two machines is not only a license violation but will also prevent one of the Office installations from working while both are on the same network.

## Configuring Entourage for your users

Now that the software has been installed, Entourage must be configured to connect to an Exchange account. It can be configured manually, via Autodiscover or using AppleScript. Determining which to use depends on the setup of the network and how much the administrator wants to simplify the end-user experience.

## Manual configuration

An Exchange account in Entourage has nearly two-dozen fields, checkboxes, drop down menus and radio buttons that may need to be set. Setting them consistently isn't always possible when users themselves must do it. Inconsistent configuration can lead to a non-working account or inconsistent appearance.

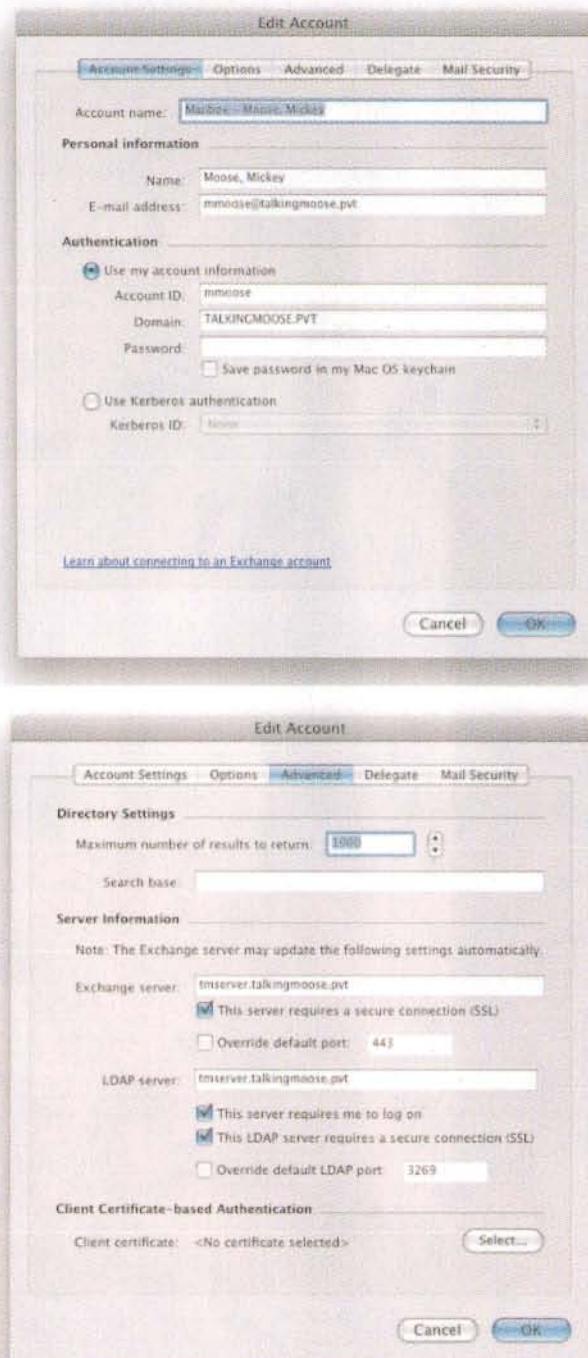


Figure 4: Exchange account settings

For example, Active Directory may be set to display names as "Last, First" and therefore mail from Outlook for Windows users will arrive in everyone's Inbox as "Last, First". Assume, however, the Entourage user is told to enter his name as "Moose, Mickey" but instead simply enters it as "Mickey Moose". When other users go to sort their mail and browse for "Moose, Mickey" they'll see no results. Everything from this user is elsewhere in the list. That can lead to some confusion.

Users aren't always technically inclined either. They probably don't know about SSL and port numbers. If they enter something incorrectly, such as using a capital "O" instead of a zero, they may not understand the difference. That will generate a Help Desk call and a little frustration on the user's part.

Even with good documentation, administrators can't guarantee 100% setup success from their users. The manual approach to configuration may be easy for the administrator but will be time-consuming and wasteful to the end-users. Avoid this method unless absolutely necessary.

## Autodiscover

A basic Exchange Server setup in a Windows-based network will support Exchange Server 2007's Autodiscover feature. This is a new service that's made possible by Exchange Web Services, the protocol replacing Outlook's MAPI and Entourage's WebDAV protocols. Because this service was designed to work with Outlook for Windows

too, Mac administrators stand a better chance of finding it supported in their network.

The administrator tells the user to simply launch Entourage. When prompted, the user should put in their E-mail address and indicate that the account is on an Exchange server. Entourage will contact an Active Directory server for its service connection point (SCP), which is an authoritative list of URLs of Exchange Servers on the network. Active Directory returns the correct Exchange Server address to Entourage and then Entourage contacts its server to download the user's information.

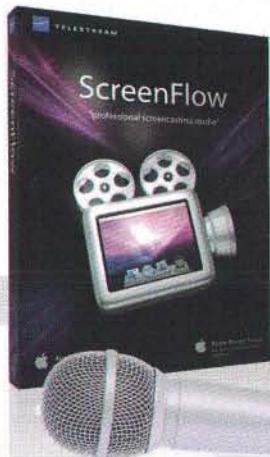


Figure 5: Account Setup Assistant

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This is a mostly complete solution for setup. It's *mostly complete* because it doesn't handle Kerberos setups. If a Mac is bound to Active Directory and a user is logged in with his network account then Entourage can take advantage of single sign-on authentication. The user shouldn't have to enter his password a second time just to access E-mail. However, Entourage doesn't handle the final step of switching a user from NTLM authentication to Kerberos. That has to be done manually by each user. Still, this is far better than manual setup.

## AppleScript

Complete Exchange settings can be configured using AppleScript. Don't know AppleScript? Don't worry.

**Writer's note:** I'm very partial to using AppleScript to configure Exchange accounts in Entourage. I wrote the scripts I'm about to mention. My scripts are probably not the only ones available but I do have a couple of years invested in writing my own and using them at work. More information is at the end of this article.

Although Autodiscover is built into Exchange and Entourage, that doesn't mean the rest of the network is properly configured. Setup stands a good chance of working in an Exchange 2007 and Entourage 2008 environment but won't work the same way if using Exchange 2003 or Entourage 2004. Entourage 2004 supports automatic setup but that's based on querying multiple servers for information rather than just the Exchange Server. It could work or partially work or not work at all. Everything has to be perfect.

For those administrators needing automatic setup but don't have Autodiscover as an option then AppleScript is an excellent choice. Every setting for an Exchange account can be set via a script. The functional part of the script is this:

### Listing 3: AppleScript for Exchange setup

```
 tell application "Microsoft Entourage"
    make new Exchange account with properties
        name:"Mailbox - Moose,
        Mickey", Exchange ID:"mmoose", domain:-
        "TALKINGMOOSE", full
        name:"Moose, Mickey", email
        address:"mmoose@talkingmoose.pvt",
        search base:"", Exchange server
        settings:(address:"tmserver.talkingmoose.pvt",-
        requires SSL:true,
        port:443), public folder server
        settings:(address:-
        "tmserver.talkingmoose.pvt/public", requires
        SSL:true, port:443), LDAP server
        settings:(address:"globalcatalog.example.com",-
        LDAP requires
        authentication:true, requires SSL:false,-
        port:3268, maximum
        entries:100)
    end tell
```

Go ahead and open the Script Editor application found in /Applications/AppleScript and enter the above

code. The instructions between the first "tell" and last "end tell" lines are all just one line. Altogether this script is really just two short lines and one very long line.

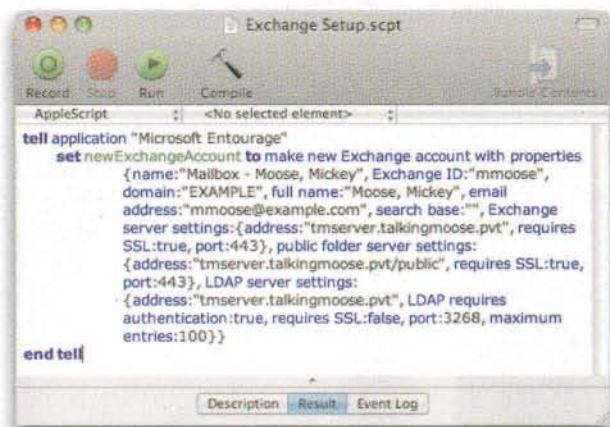


Figure 6: Exchange setup AppleScript

The setup script is chock full of "application keyword" and "value" pairs, which are separated by colons. For example, the user's name appears as:

full name:"Moose, Mickey"

The "full name" keyword is the Entourage term that describes the Name field his Exchange account and "Moose, Mickey" is his actual full name. Note that text items are surrounded by quotes. Replace the values with those specific to your network and click the Run button while Entourage is open and in less than a couple of seconds a new Exchange account with a name of "Mailbox - Moose, Mickey" will appear under Tools à Accounts.

With a little more logic and smarts added to the AppleScript, it can pull the user's short name and full name from Mac OS X's system settings. It works especially well if the Mac is bound to Active Directory. With some additional work on the administrator's part, he can set the script to run under a schedule "At Startup" so that the user gets the experience of launching Entourage for the first time and simply entering his password to log in to his account. A full script is freely available on The Entourage Help Page.

## Maintaining Entourage for your users

E-mail stores change. Messages are constantly being received, sent, sorted and deleted. This can lead to problems if not properly maintained. Users may go over their quotas, their local Entourage Databases may get corrupt or performance may just be very, very slow. Exchange accounts in Entourage are different from POP and IMAP accounts and need specific attention.

These few tips and tricks will help you resolve probably 90% of your Entourage and Exchange performance problems.



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## Optimizing Entourage

Entourage can connect directly to a back-end server, which is an Exchange Server that actually hosts user accounts, or it can connect to an OWA front-end server, which allows the user to access his Exchange account from the Internet. The server address plays an important part of Entourage's perceived performance.

Laptop users often like to use the OWA address because they find that it allows them to access their E-mail from inside the company network as well as at home or while traveling. Using an outside address while inside the company network may severely decrease performance because data is probably traveling through a proxy server, a firewall, an OWA server and then to the user's back-end server. Teach your users to connect to an internal address while inside the company network and connect to an external address while outside. **Writer's note:** I have a script listed at the end of this article that will dynamically change addresses for the laptop user.

Encourage users should keep their Inboxes as small as possible. This folder is special and gets synchronized more frequently than other folders. A few hundred messages will probably be fine but several thousand, even in sub-folders, can slow entourage to a crawl. Users will notice they are not receiving mail immediately but rather several minutes or hours later.

If users are connected over a slow WAN link then they may want to put their Exchange account into **Headers only** mode. This is the closest equivalent of "online" viewing that Outlook for Windows users enjoy. It prevents the entire message from being downloaded until the user decides to preview or open the message. To put the Exchange account into **Headers only** mode, edit the account in Entourage and set it to partially receive messages over 9999 KB. That sounds counter-intuitive but that's how it works. The account name will appear in the folders list with "(Headers only)" appended to the end of the name.

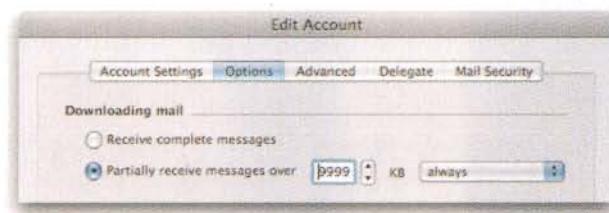


Figure 7: Headers only settings

## Archiving

Users will run over server storage limits if allowed but may not understand that they have reached their quota or what's consuming their space. To help them learn where the bulk of their mail is stored within their account, direct them to right-click or Control-click their Exchange account in the Folder List at the left of the Entourage main window and select **Folder**

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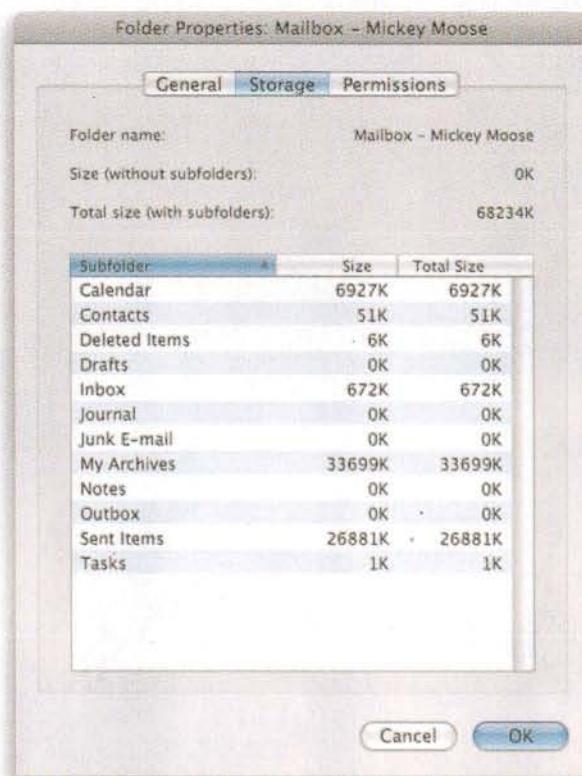
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**Properties.** Under the **Storage** tab they'll find a breakdown of their folders and how much space each is consuming.



**Figure 8: Folder Properties: Storage**

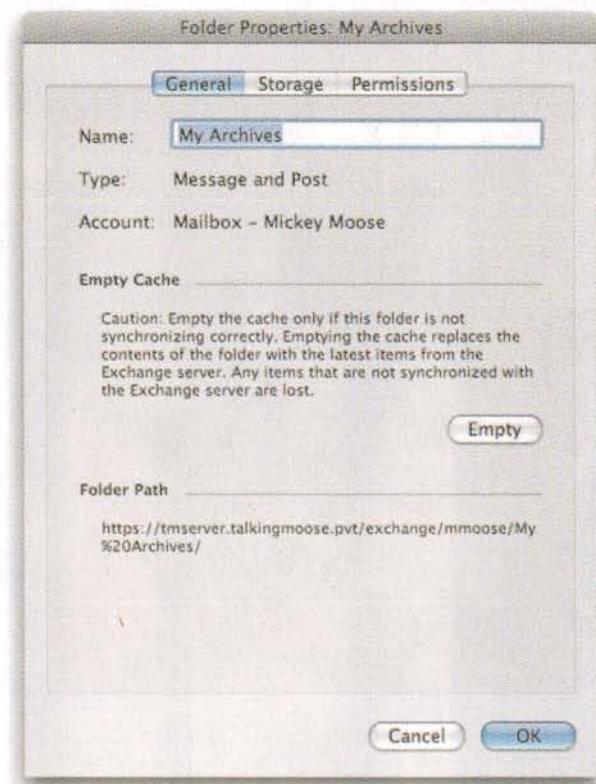
Archiving is a weak area for Entourage because, unlike Outlook, it has no archiving feature per se nor does it use Personal Storage files (PSTs). It does have the folders **On My Computer**, which can't be deleted and these are the ideal location to move messages offline. To copy messages from an Exchange account to archive folders under **On My Computer**, simply select one or more and drag them over. To *move* messages, in other words copy to the folders **On My Computer** and delete from the Exchange Server, hold the **Command** key while dragging. This too can be automated with AppleScript. The Entourage Help Page has one available for download.

### Clearing caches

Every once in a while a user may notice that messages in a mail folder or his calendar events aren't syncing to the Exchange Server. This certainly makes using Exchange from multiple locations difficult. Entourage synchronizes with Exchange and therefore it's creating a local copy of everything in the account. When mail messages, calendars, contacts, tasks or notes aren't syncing then the local cache may need to be cleared and synchronized again.

Caches can be cleared for the entire account or just the problematic folder. Similar to checking storage usage, direct users to right-click or Control-click their Exchange account in the Folder List at the left of the Entourage main window and select **Folder Properties**. Under the **General** tab have them click the **Empty**

button. Local messages will be deleted and then server-side messages will be synchronized. Depending on the size of the folder before emptying the cache, synchronization may take a while.



**Figure 9: Folder Properties: General**

The **Sent Items** folder must be handled with care! Remember, when clearing caches local messages are deleted and then restored from the server and that means your user could potentially lose messages if he empties the cache for this folder. Be sure that he creates a local backup by copying messages from the **Sent Items** folder to a folder under **On My Computer** first.

### With great power comes great responsibility

Entourage and Exchange are a powerful set of tools for collaboration and are relatively easy to use. Supporting them isn't difficult most of the time and for the most part they just work. The end-user experience, however, is affected by the administrator's preparedness.

Deployment and configuration can be as intrusive as having to sit in front of the user's machine, installing the software, configuring it and asking the user to test. It can be as unobtrusive as simply telling him to launch Entourage and start working. Support can be aggravating for both the user and the administrator when the administrator doesn't invest time in how Entourage works. The pain can be mitigated, however, with a basic understanding of Entourage's features and tools.

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No one method of deployment, setup and support will fit all environments but you have a plethora of options available to you. Pick and choose what works best not only for you but also your users. Time spent upfront preparing your environment and understanding how Entourage works will be well rewarded in the time saved supporting it.

## More information

Microsoft Windows Small Business Server

<http://www.microsoft.com/smallbusiness/products/server/>

Hosted Business E-mail and Collaboration Catalog

<http://www.microsoft.com/hosting/catalogredirect.aspx?catalogID=3>

About Exchange Labs

<http://technet.microsoft.com/en-us/exchangelabshelp/cc511381.aspx>

Evaluate Exchange Server 2007 Service Pack 1

<http://technet.microsoft.com/en-us/exchange/bb330851.aspx>

InstaDMG

<http://www.cfp548.com/article.php?story=ImageCreationRevolution&query=instaDMG>

Radmind

<http://rsug.itd.umich.edu/software/radmind/>

Apple Remote Desktop

<http://www.apple.com/remotedesktop/>

The Casper Suite

<http://www.jamfsoftware.com/>

Mactopia IT Pros

<http://www.microsoft.com/mac/itpros/default.mspx>

Entourage Exchange Setup 3.0 AppleScript

<http://www.entourage.mvps.org/exchange/exchangesetupv3.html>

Automatically switch Exchange addresses

[http://blog.entourage.mvps.org/2007/06/testers\\_needed\\_for\\_script.html](http://blog.entourage.mvps.org/2007/06/testers_needed_for_script.html)

AutoArchive Exchange Account to "On My Computer"

<http://www.entourage.mvps.org/exchange/autoarchive.html>



## About The Author

William Smith is a technical analyst supporting Macs in a Windows world in the Twin Cities, a six-year Microsoft MVP and is co-founder of the Entourage Help Blog <<http://blog.entourage.mvps.org>>. He can be reached at [bill@talkingmoose.net](mailto:bill@talkingmoose.net).

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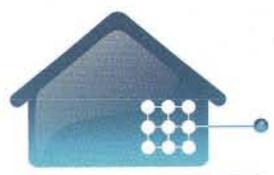
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# Getting Set to Start Out Right as a Start-up

All we know about starting an Apple business, from the idea, to product launch and beyond.

by Michael Göbel and Oliver Pospisil,  
*Inspired By Life*

## Inside Inspired By Life

A few weeks ago, Michael and I talked about the status of finding a seed financier to help us turn our idea into actual software. We asked ourselves whether we should take a wait-and-see approach or make it happen now?

**Michael:** I want to get the ball rolling because our idea really works. The white knight will show up one of these days. That's for sure. But the question is when: next month, in six months, or even next year? In light of the current economic turmoil, it will more likely be later than sooner. But waiting a whole year is just a sheer waste of time. (pause)

**Oliver:** The times are tough. Yet a friend of mine used to say "There is a market for a good product - anytime."

**Michael:** And we get rid of, literally speaking, a really annoying pain in the neck. Consumers are willing to pay the going rate, even during turbulent times. In order to move ahead without any seed financing, we have to boil our idea down to its very core.

**Oliver:** That's true. When I was in New York last October, I used our software prototype to get ready for an important meeting. My hotel room was incredibly small and I had to make preparations on either one or two pieces of paper or on my MacBook. I quickly realized: Paper is not right for brainstorming. I could not arrange and rearrange my ideas to try out different scenarios - all on just one piece of paper without having to start all over again, and again, and again. So I took the MacBook and used our software, et voilà: I could arrange and rearrange my ideas exactly like I needed to. Ultimately, I had the perfect roadmap for a win-win meeting.

**Michael:** Cool! Who says that brainstorming with a computer always has to be a tree-like structure? This is how I wanted to work. Let's go and reframe the original idea.

**Oliver:** Yes, let's make it happen!

## Introduction

You don't want to sit back and wait either? You want to start your Mac business now. You want insights and useful examples for great software, application icons, codes, websites and much more. Start reading now and find out for yourself how to do it!

In this series of articles, you will find out what we know about starting a business up on the Apple platform and about staying in business over the long haul.

Michael already started his Apple-only company MOApp up in 2004 and he has now developed more than ten applications - six of them are Apple staff picks. He knows how to craft easy-to-use and highly sophisticated software and how to stay in business successfully. Michael does everything from software development, icon design, website development to sales management and public relations. He is a real micro Independent Software Vendor (ISV).

I have been in the software business for over ten years, specializing in areas ranging from Palm programming to large-scale, in-house Java projects. I bought my first Macintosh Classic in 1991. In 2006, an idea grabbed my attention that we are now both working on. I'm still working full-time for a German retail company and will be until our new business starts paying off our bills.

As partners, we have started a new business up, turning our idea into a genuine product: Inspired by life.

Next, you will find out why the Apple platform is the right one, and what we classify as excellent software as well as the topics we delve into throughout this series of articles.

## Apple's eco-system

Isn't it kind of ironic that the deep global economic crisis is breaking all-time highs when it comes to burning billions and billions of dollars, while Apple is earning billions at the same time?

And you really want to start your business up right now? In times when practically everybody is worried about losing their job or going out of business!

Amidst today's credit crunch, consumers think twice about how to spend their money and they are much more price sensitive. That is great because the haze of vaporware ("software that fails to fulfill users' expectations") tapers off and it is easier to focus on applications that solve real world problems, that are crafted with passion for detail and that are really worth their money. Your idea delivers value to the user's life, doesn't it?

Bull or Bear, people will always buy computers and they will continue to switch over from their former Windows systems to Apple. People need computers and useful tools to help them get their job done – in a sustainable way. After all, quality is what counts, time and time again.

You think the times are too tough? Well, yes they are. But, just look at Joel Spolsky and Michael Pryor. They started FogCreek up in 2000 and are raking in revenue today. That's why you must focus on the future: Once the economy gets back on track, your business will be well established, and you will know how to fulfill your customers' real needs when times get rough and you will have learned how to come out a winner amidst this sharp economic downturn.

If you can make your business a success now, then you can make it happen anytime, anywhere.

## Apple is setting new records by harnessing billions of dollars in revenue

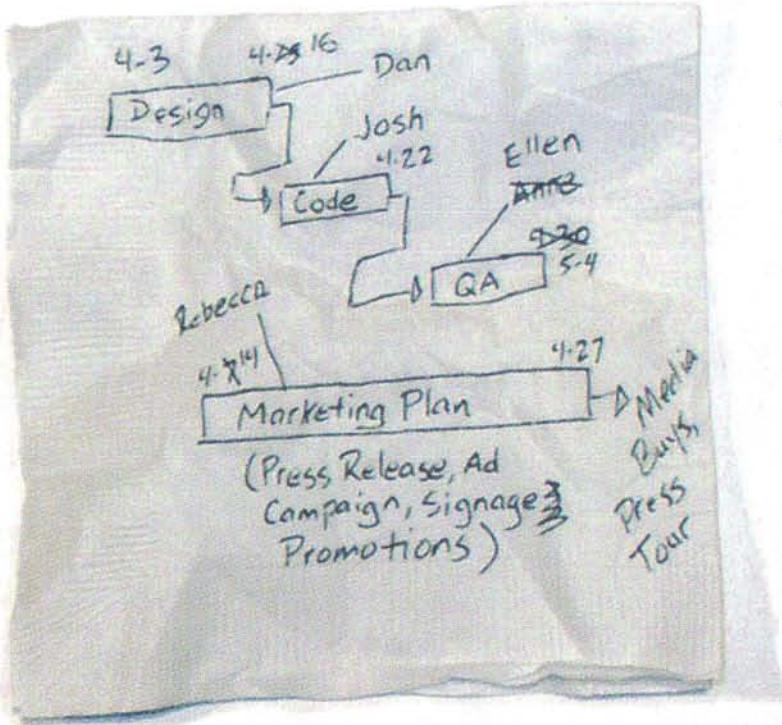
Apple pulled in 1.6 billion dollars in Q1/2009 and seized a 10% market share in just a few years. To accomplish this, Apple's growth rate has been much higher than that of the overall PC market (21% Apple to 13% PC market). Nearly every quarter, Apple sets new sales records and even the economic downturn cannot stop them. It sure looks like they are doing things right.

Get the latest news from the following links:

- <http://developer.apple.com/business/>
- <http://www.apple.com/investor/>

No matter where you look, Apple is leading the market: in the business management, consulting and educational sectors, just to name a few. Apple is also gradually becoming the preferred solution for small- and mid-sized enterprises from all industry sectors. And, of course, people really love their Macs when it comes to the add-on features of design, music and photography. Macs are positioned at the high-end – and not at the dead-end. Today, using an Apple computer is the sign of a professional with style. It therefore comes as no surprise that Apple is leading in surveys concerning user satisfaction with the hardware as well as with its operating system.

For you, it is great to know that Apple provides you with quality support and that you have a helpful developer



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community at hand. Apple delivers state-of-the-art APIs and developer tools that they use themselves. Apple keeps its promise of making their APIs publicly available –albeit after a short delay.

Apple processes OS X by streamlining Snow Leopard, which translates into more speed, and more reliability. You can choose whether to develop for the Mac, the hip iPhone or for both.

The Apple eco-system is more like a real community: Users do not have to search for ages, instead they just need to click on a few downloading sites with the highest hit rates:

- <http://www.apple.com/downloads>
- <http://www.versiontracker.com/macosx>
- <http://macupdate.com>

The press is always open to new, highly innovative products, which makes it easier to gain visibility than is the case on the Windows platform.

And last but not least, Apple users are happy to pay for tools that are easy-to-use and that have a sophisticated design and feel.

## Case examples of innovative software

The following examples will show you what great software is made of. We will highlight the coolest features in each example.

### Example 1: Pixelmator ([pixelmator.com](http://pixelmator.com))

Pixelmator is image editing the Apple way. Before Pixelmator came onto the scene, the gap was huge with regard

to the functionality between pro tools like Photoshop and simple image editors. Pixelmator has definitely changed the rules of the game. You can now get all of the functionalities you typically need in a sleekly designed application for just \$59.

### Example 2: Checkout ([checkoutapp.com](http://checkoutapp.com))

In the past, the GUI of point of sales applications resembled SAP more than that of a typical Mac application. Werck crafted a POS application with a terrific GUI. In addition, they solved the (POS) problem in a holistic way. They looked at the whole business process – and not just at the cash machine. Checkout is a real one-stop-shop when it comes to opening up a shop. Don't forget to check out their website ([www.checkoutapp.com](http://www.checkoutapp.com))!

### Example 3: On the Job ([stuntsoftware.com](http://stuntsoftware.com))

The easy-to-use time tracking and invoicing application (to be quite honest: Michael sure is envious about the perfect way that this has been achieved). After talking to users extensively, the end result is an application that is crafted with love, with passion for detail and that has deep insights into exactly what the customers want.

### Example 4: Eventbox ([thecosmicmachine.com](http://thecosmicmachine.com))

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## Example 5: 1Password (agilewebsolutions.com)

Just look at the awards! If I hadn't seen it myself, I would never have believed that a password handling application could stimulate such enthusiasm.

## Example 6: Coda (panic.com)

When it comes to creating websites, not only does Coda give you a tool that replaces five applications. It also integrates the right manuals to build great websites, too. They obviously sat back and thought about the website development process as a whole and from a fresh perspective.

## Example 7: Things (culturedcode.com)

Primus inter pares ("first among equals") of all task management applications. Look at the icon! What you see is what you get.

## This is what all of these tools have in common:

- They closed a gap that others overlooked
- They crafted an easy-to-use cure for users' annoying and highly frustrating pain in the neck
- They listen to their users carefully and take appropriate action
- They are passionate about the GUI and pay attention to each single detail
- Their website lets you grasp at one glance what it's all about and they make it easy to try it out and then buy it in a solidly convinced way

To be as good as they are, you must lean back and look at your software as a whole product. This includes the software itself, the application icon, user manual (and like Coda, additional books), websites, pricing, sales process, support and serving your customers with quality at all times.

## The bottom-line

If you want to play in that league of great software, move ahead.

If you want to take pride in your craftsmanship, move ahead.

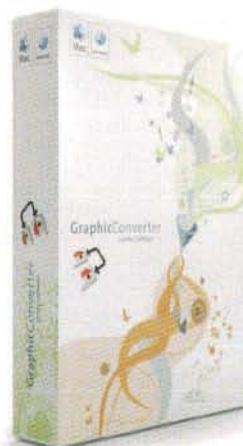
If your product solves a user's annoying pain in the neck, then move ahead.

## What does this series of articles entail?

Here are the kinds of topics we'll be covering:

- Your idea: Solve a real problem and make this world a better place
- The Business: What you gain from writing a business plan
- Humane project planning: Joel's Excel sheet, FogBugz or Merlin

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Sink, Eric. *Eric Sink on the Business of Software*. New York, 2006.  
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- <http://www.jelonsoftware.com>
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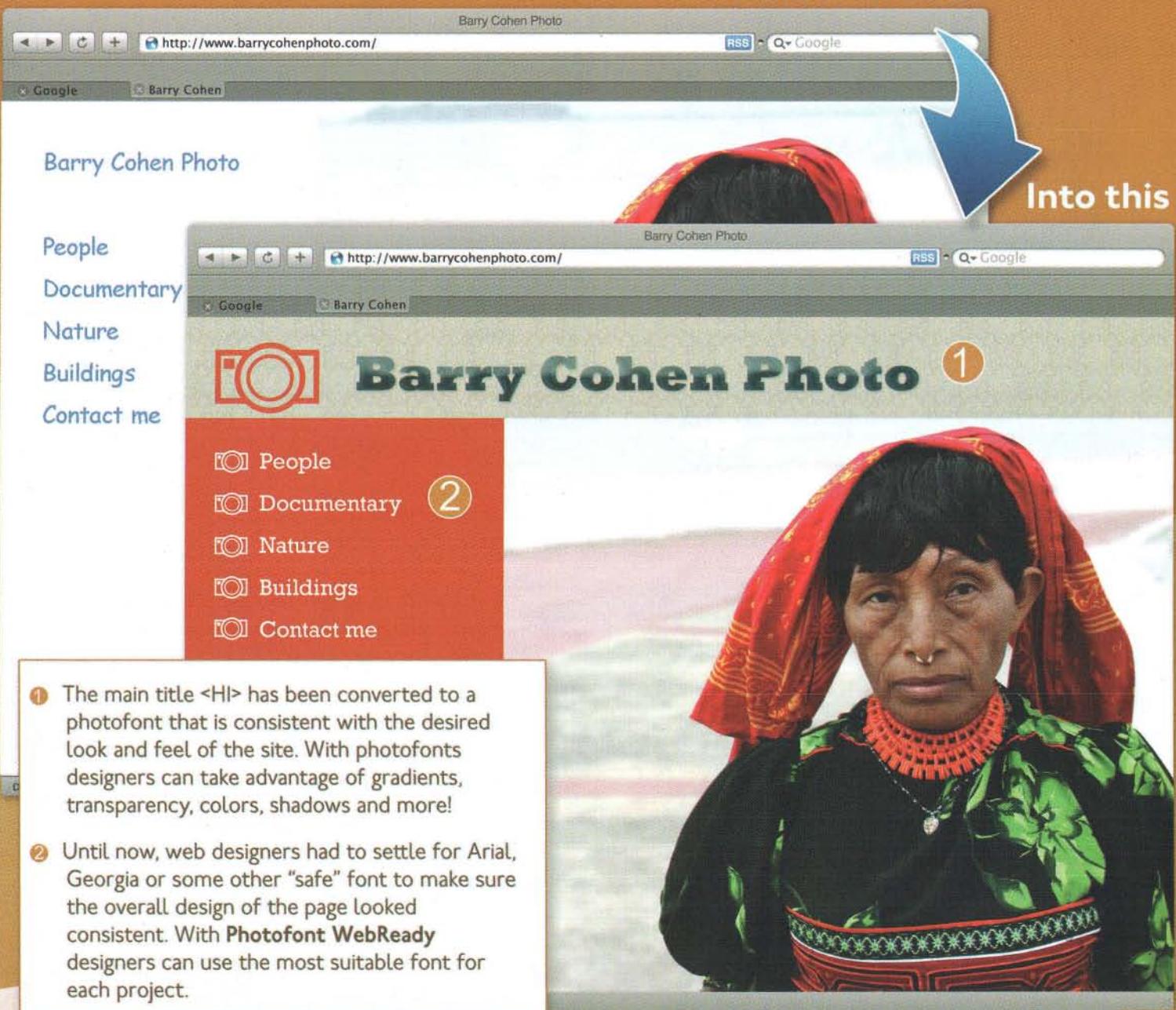
## About The Authors

Michael started MOApp up in 2004 and he has now developed more than ten applications - six of them are Apple staff picks. He does everything from software development, icon design, website development to sales management and public relations.

Oliver has been in the software business for over ten years, specializing in areas ranging from Palm programming to large-scale, in-house Java projects. In 2006, an idea grabbed his attention that both are now working on. He is still working full-time for a German retail company and will be until the new business starts paying off their bills.

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## Windows to the World

### Windows, Panels, and Sheets

#### Introduction

We've seen and used windows before; every one of our GUI applications has used one. This month we're going to talk a little bit more about windows and some of their relatives: panels and sheets.

On screen, windows are represented by the `NSWindow` class. We've been creating windows by using Interface Builder. Both the `MainMenu.xib` for non-document based applications and `MyDocument.xib` for document-based applications contain an instance of `NSWindow`. For this article, let's start with a clean Cocoa application (not a document-based application).

The Cocoa application project template provides you with a `MainMenu.xib` that contains the main menu and the main window. Interface Builder allows you to configure several attributes for the window, and Figure 1 shows the attributes setup for the main window.



Figure 1: Main window attributes in Interface Builder

The most important attribute for our purposes has been **Visible At Launch**. This means that the window is automatically displayed on the screen when the nib file is loaded by the application. AppKit automatically loads `MainMenu.nib` when applications startup, so this is why our main window gets displayed when the application is run. For document-based applications, AppKit loads `MyDocument.nib` when a new document is created, again creating the document window. (Remember that `.xib` files are compiled into `.nib` files, and `.nib` files are stored in your application's bundle.)

Adding another window to our application is nearly as simple as dragging a new window from the Interface Builder **Library** into your application. I say "nearly" because the default options (as of Interface Builder version 3.1.1) are less than ideal. Open the `MainMenu.xib` file. In order to help reduce confusion between our two windows, rename the main window's title to **Main Window**, and drag a new window from the **Library**. Figure 2 shows the attributes for a new window dragged from the **Library**.



Figure 2: Default window attributes

Two checkboxes are different than our main window: **Release When Closed** and **One Shot**. What if, however, we do not want the window to be visible at launch, and we want to show the window programmatically? We need to uncheck **Visible at Launch**, but we should also uncheck **Release When Closed**. Otherwise, the `NSWindow` object gets released automatically when the window is closed, and any attempts to make the window visible again will cause a crash. This commonly trips people up, beginning and advanced programmers, alike. I almost never want the behavior of **Release When Closed** checked, but I sometimes forget to uncheck it.

The **One Shot** attribute is useful for windows that are not expected to be on screen all the time and are only displayed once or twice. This allows the system to free some of the window's

resources when it's not visible. Let's check that one, too. And finally, change the title to **New Window**. The customized attributes for our new window are shown in Figure 3.

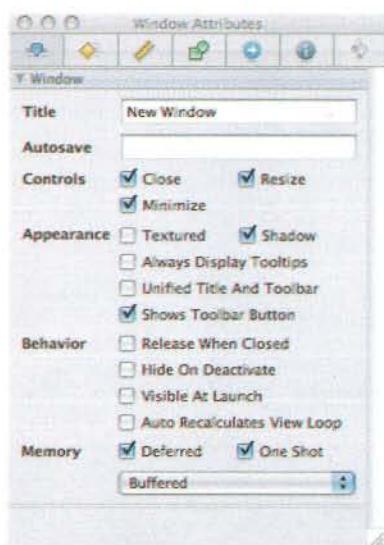


Figure 3: Customized window attributes

Let's add a button to the main window that, when clicked, will show this new window. Start by dragging a button to the main window. We don't need any code to display the window as we can hookup the button to actions already defined on the `NSWindow` class. Control drag from the button to the window and set the action to `makeKeyAndOrderFront:`. This action method makes the window visible, if it is not already, and then makes it the front-most window.

So, what's with the strange method name, then? AppKit uses the term *key window* as the window that is currently receiving user input from the keyboard and mouse. There can only be one key window in an application. In fact, `NSApplication` has a method called `keyWindow` that returns the application's key window.

It's worth noting that one of the things you get "for free" when using AppKit is the **Window** menu you see in most applications. Along with the commands to minimize and zoom windows is a list of all windows in the application. AppKit automatically updates this list of windows. Thus, when we make our new window visible, the **Window** menu will get updated as shown in Figure 4.



Figure 4: Window menu

## Panels

A *panel* is a special kind of window that is used mainly as an auxiliary window. Panels are represented in code using the `NSPanel` class, which is a subclass of `NSWindow`. Panels differ from windows in a few respects:

Panels are removed from the screen when the application is not active,

Panels do not get listed in the **Window** menu, and

Panels can be closed by pressing the **Escape** key.

Panels can also be configured to have utility style where it uses a smaller window bar and it floats above all other windows, even when it's not the key window.

Let's add a panel to our application to get a feel for how they work. Add another button to our main window with a title of **Show Panel**, as shown in Figure 5.



Figure 5: Show Panel button

Drag a panel from the Library window into your nib file, and switch to the **Attributes** tab. The default attributes for a panel are shown in Figure 6.

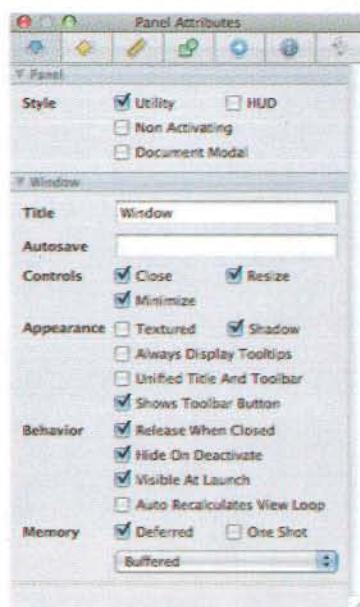


Figure 6: New panel attributes

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By default, it's configured to use the **Utility** style. You can uncheck this if you want a panel to look more like a window, such as a standard **Find** panel. We're going to customize the rest of these attributes a bit. First, change the title to **New Panel**. Again, uncheck **Release When Closed** and **Visible At Launch**, and check **One Shot**. The customized panel attributes are shown in Figure 7.



Figure 7: Customized panel attributes

Finally, we need to hook the button up to the panel's `makeKeyAndOrderFront:` action by control dragging from the button to the panel. Run your application again and notice the difference between the new window and the new panel. Notice how the panel behaves differently than the windows and that it does not show in the **Window** menu.

## Alerts

Sometimes you want to display a simple dialog box to the user to notify them of an event or ask a simple yes/no question. You could create and layout a new window every time you wanted to do this, but that is a bit of a hassle. Fortunately, AppKit provides alerts so you can easily provide simple dialog box-like windows. An example of an alert is shown in Figure 8.

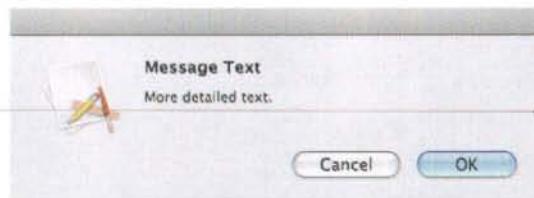
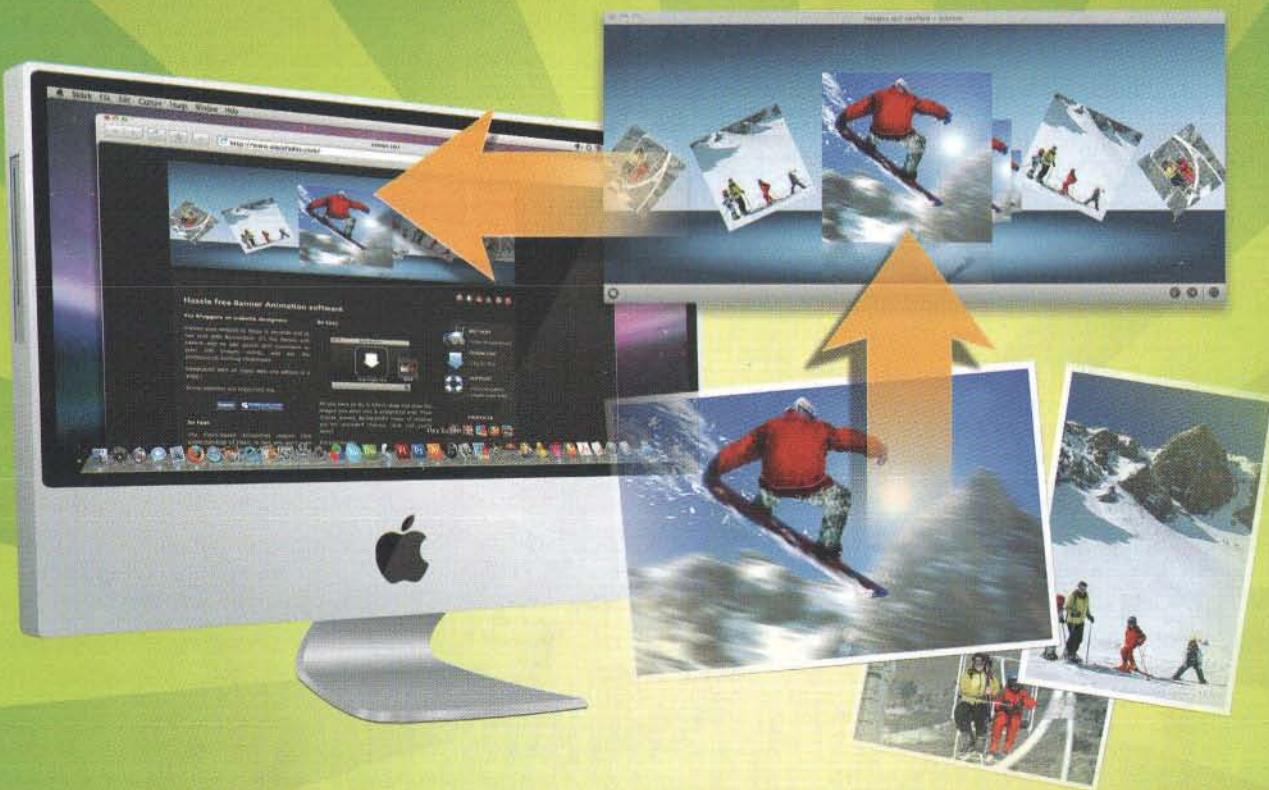


Figure 8: Sample alert window

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We do need to write code to demonstrate how to use alerts, so let's create an AppDelegate class. Add this action method to your AppDelegate

```
- (IBAction)showAlertWindow:(id)sender
{
    NSAlert * alert = [[[NSAlert alloc] init] autorelease];
    [alert setAlertStyle:NSWarningAlertStyle];
    [alert setMessageText:@"Message Text"];
    [alert setInformativeText:@"More detailed text."];
    [alert addButtonWithTitle:@"OK"];
    [alert addButtonWithTitle:@"Cancel"];

    NSInteger result = [alert runModal];
    if (result == NSAlertFirstButtonReturn)
        NSLog(@"OK pressed");
    else if (result == NSAlertSecondButtonReturn)
        NSLog(@"Cancel pressed");
}
```

The basic sequence for using alert windows is fairly simple. We need to create an instance of the NSAlert class, setup various parameters, and finally display it. There are three kinds of alert styles, and they represent the severity of the event you are trying to present to the user:

NSInformationalAlertStyle

NSWarningAlertStyle

NSCriticalAlertStyle

These can affect the icon used; for example, a critical alert will display an exclamation mark.

The message text is a short, one-line summary of the situation, for example, "Delete the record?" The informative text can be

longer and more detailed, for example, "Deleted records cannot be restored. Are you sure you want to continue?"

You can add buttons to the alert, and they are added to the window from the right and going towards the left. Notice that the "OK" button was added first, and is furthest to the right. Also, the first button added is the default button and is assigned a key equivalent of **Return**. That's why it is blue in Figure 8. Any button named "Cancel" is assigned a key equivalent of **Escape**, as well.

With our alert all configured, it's time to display it with the `runModal` method. It does not return until the user presses a button, and returns the user's choice. It returns a constant based on which order the buttons were added; hence `NSAlertFirstButtonReturn` corresponds to the "OK" button in this example.

The `runModal` method displays the alert as a *modal window*. Modal means that the rest of the user interface is not accessible until the user responds to alert. This means the user cannot interact with any of the other windows or any of the menus. The user cannot even quit your application until they deal with the alert. This kind of behavior is generally frowned upon. You do not want to display modal dialog boxes very often because they disrupt the user's ability to use your application. Use them sparingly.

With our action written, switch to Interface Builder so we can hook it up to a button. We're going to need to instantiate the AppDelegate class and a new button, and then hook up the button to the `showAlertWindow:` action.

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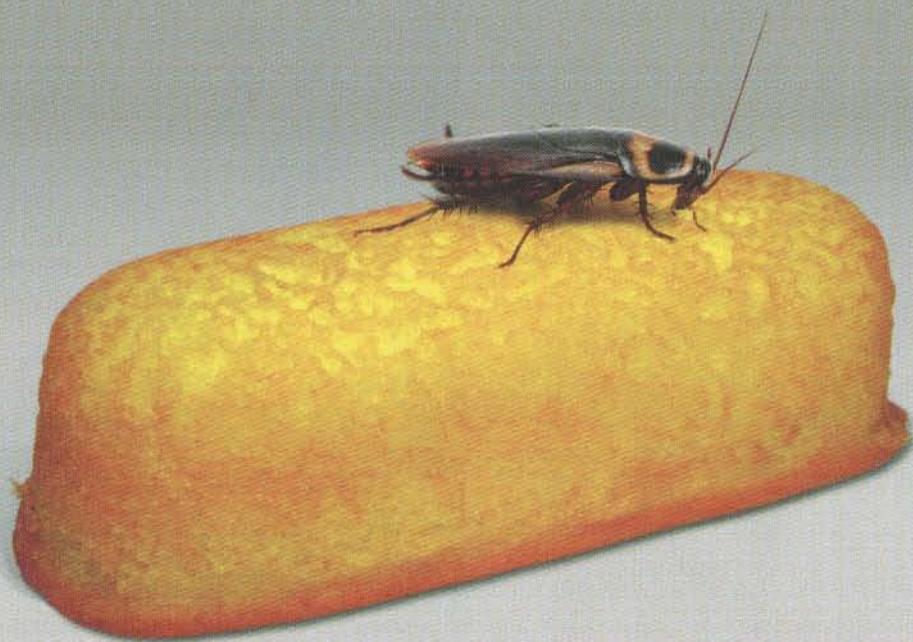


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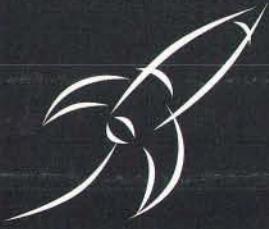


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## Alert Sheets

There is another variant of an alert that is less intrusive than modal windows called *sheets*. Sheets are attached to a specific window. When displayed, they animate down from the title bar. You can think of them as modal to a specific window. You cannot interact with the attached window until you respond to the sheet, however other windows and the menus remain responsive. An example of the same alert displayed as a sheet is shown in Figure 9. The sheet has the same information as the alert window, but it is now attached to the main window.



Figure 9: Sample alert sheet

Sheets are a little bit more complicated to use for a couple reasons. First, you need to attach a sheet to a specific window. We're going to use an outlet to the main window, but there are other ways you can get a reference to a window, depending on the situation. Second, displaying a sheet is a two-step process. Let's look at the code:

```
@synthesize mainWindow = _mainWindow;  
- (IBAction)showAlertSheet:(id)sender  
{  
    NSAlert * alert = [[[NSAlert alloc] init] autorelease];  
    [alert setAlertStyle:NSIntegerAlertStyle];  
    [alert setMessageText:@"Message Text"];  
    [alert setInformativeText:@"More detailed text."];  
    [alert addButtonWithTitle:@"OK"];  
    [alert addButtonWithTitle:@"Cancel"];  
  
    [alert beginSheetModalForWindow:_mainWindow  
        modalDelegate:self  
        didEndSelector:@selector(alertDidEnd:result:contextInfo:)  
        contextInfo:nil];  
  
    - (void)alertDidEnd:(NSAlert *)alert  
    result:(NSInteger)result  
    contextInfo:(void *)contextInfo  
    {  
        if (result == NSAlertFirstButtonReturn)  
            NSLog(@"OK pressed");  
        else if (result == NSAlertSecondButtonReturn)  
            NSLog(@"Cancel pressed");  
    }  
}
```

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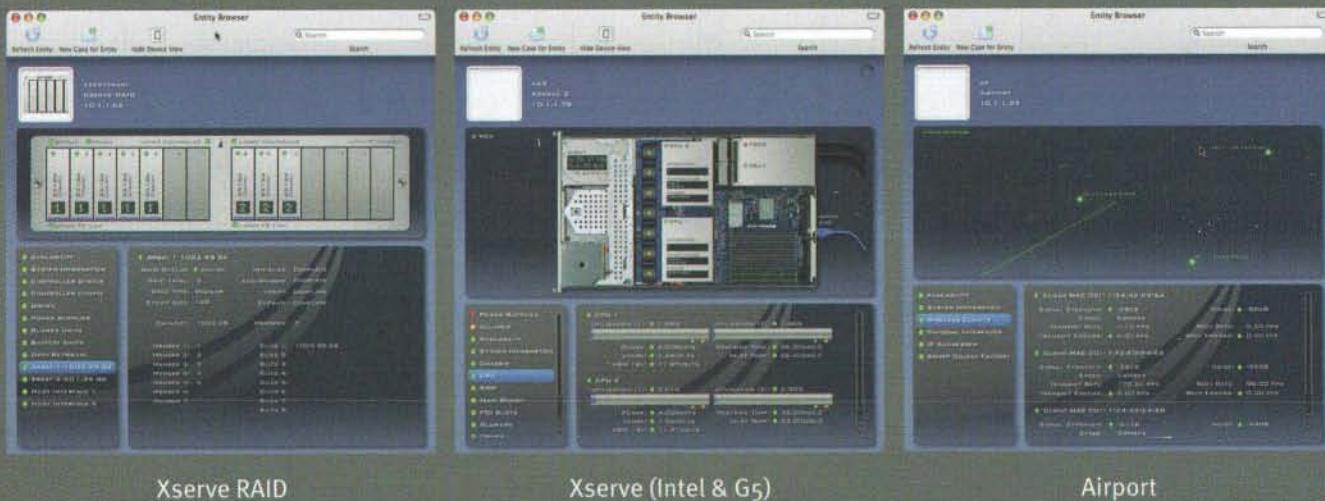
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The basic setup of the `NSAlert` object is the same; however, we display the sheet with the `beginSheetModalForWindow:...` method. This method takes several arguments because displaying a sheet asynchronous. This method returns right away and does not wait for the user to respond. Thus, we need to setup a delegate method that gets called when the user finally does respond.

The reason for the change in behavior as compared to `runModal` has to do with some details of how the AppKit event system is designed. The simple reason is that `runModal` blocks the entire application from running until the user responds, whereas a sheet only "blocks" a single window. All other windows need to respond normally. By returning just after the sheet is displayed, it allows the system to handle and respond to events for other windows.

The "did end" selector of the modal delegate works in a similar fashion to the target/action behavior of buttons and menus. The selector is called on the modal delegate object and can be named whatever you like. However it must take three arguments: the alert itself, the status, and the context info. The context info is the same as you passed into the `beginSheet...` method. You can use this to squirrel away some information that may not be available in instance variables.

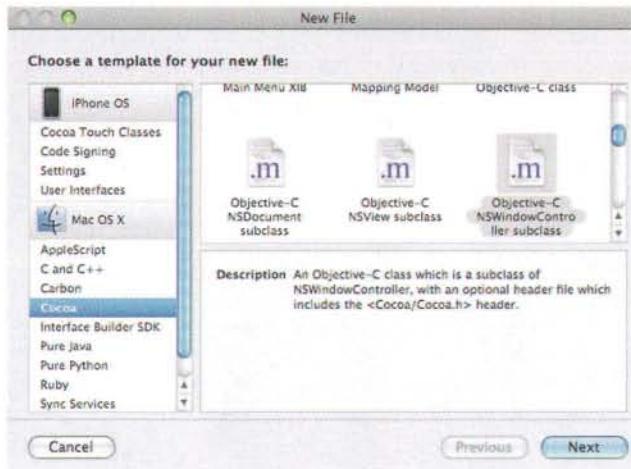
To test this out, add yet another button to the main window and hook it up to this new action. You should see the sheet appear as shown in Figure 9 and you should see the log statements when the buttons are pressed.

## Loading Windows from Nibs

Alerts are great for simple cases, but sometimes you need to create your own custom window. Perhaps you want a preferences window or an info panel or you want to have alerts with more controls on them. In these cases, you'll have to create your own windows, similar to what we did above. However, rather put all auxiliary windows in the main nib, you are better off putting them into their own separate nib. By doing this, you only load the windows as you need them, thus saving memory and resources by not creating windows you may never even display.

Let's go through the steps necessary to create and use a window that is stored in its own nib. There is a class that's very handy for loading windows from a nib file called `NSWindowController`. While there are other ways of loading nib files (through `NSNib` and `NSBundle`), you should generally want to use a window controller as it takes care of some memory management issues for you. Subclassing `NSWindowController` also provides a place to put outlets and actions associated with that window.

Start by adding a new file to your application. Under the Cocoa section, choose Objective-C `NSWindowController` subclass, as shown in Figure 10. Set the name of the new class to `MyWindowController`.



**Figure 10: New NSWindowController subclass**

We're going to add an action to our AppDelegate class to display a window. Make the header file match Listing 1.

### **Listing 1: AppDelegate.h**

```
#import <Cocoa/Cocoa.h>

@class MyWindowController;

@interface AppDelegate : NSObject
{
    NSWindow * _mainWindow;
    MyWindowController * _myWindowController;
}

@property (nonatomic, retain) IBOutlet NSWindow * mainWindow;

- (IBAction)showAlertSheet:(id)sender;
- (IBAction)showAlertWindow:(id)sender;
- (IBAction)showWindowFromNib:(id)sender;

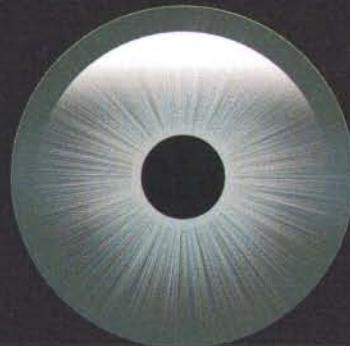
@end
```

I've added an instance variable for `_myWindowController`. I've also added a `showWindowFromNib:` action method. Now, let's jump to the implementation file and add the following method:

```
- (IBAction)showWindowFromNib:(id)sender
{
    if (_myWindowController == nil)
        _myWindowController = [[MyWindowController alloc]
init];
    [_myWindowController showWindow:self];
}
```

You'll have to add an `#import "MyWindowController.h"` to the top of the file, too. What this does is create a new `MyWindowController` instance, if we don't already have one. This makes sure our nib is only loaded when it is actually needed. Creating windows like this saves memory and other resources.

The `showWindow:` method is a method of `NSWindowController` that shows its associated window. It's very similar to the `makeKeyAndOrderFront:` method we used earlier, but it takes care of loading the window from the nib and any other housekeeping tasks that need to be done before making the window key.



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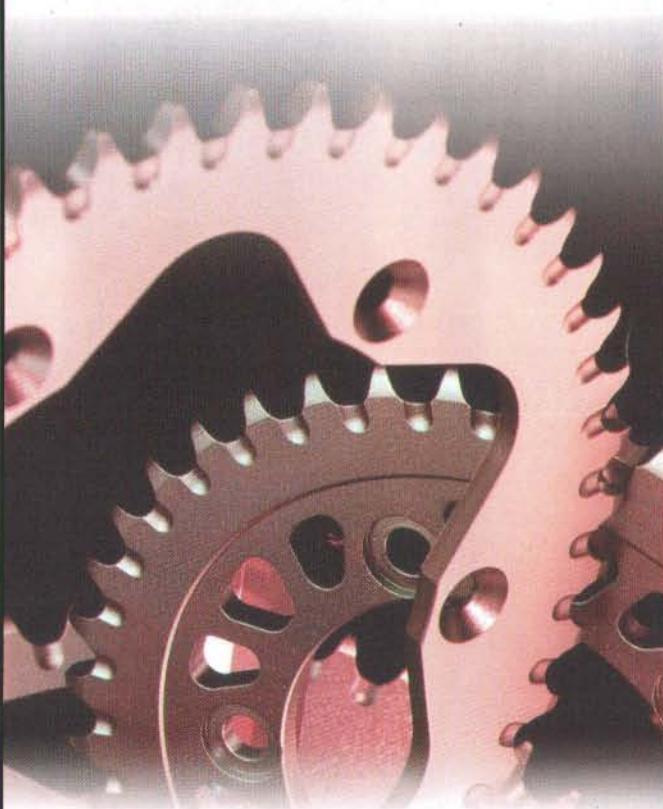
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Back in Interface Builder, add another button to our main window titled **Show Nib Window**, as shown in Figure 11. Hook up this button's action to the `showWindowFromNib:` action on the `AppDelegate`.



**Figure 11: Show Nib Window button**

Now let's flesh out our window controller subclass. Make the `MyWindowController.h` file match Listing 2.

**Listing 2: MyWindowController.h**

```
#import <Cocoa/Cocoa.h>
```

```
@interface MyWindowController : NSWindowController
{
    NSButton * _sampleCheckbox;
}

@property (nonatomic) IBOutlet NSButton * sampleCheckbox;
- (IBAction)toggleCheckbox:(id)sender;
@end
```

We're going to add a checkbox to the window, so I went ahead and created an outlet for it. I also created an action for the checkbox. The `MyWindowController.m` file is shown in Listing 3.

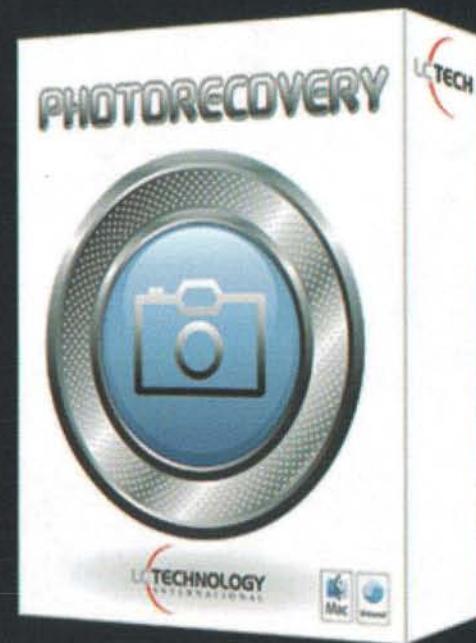
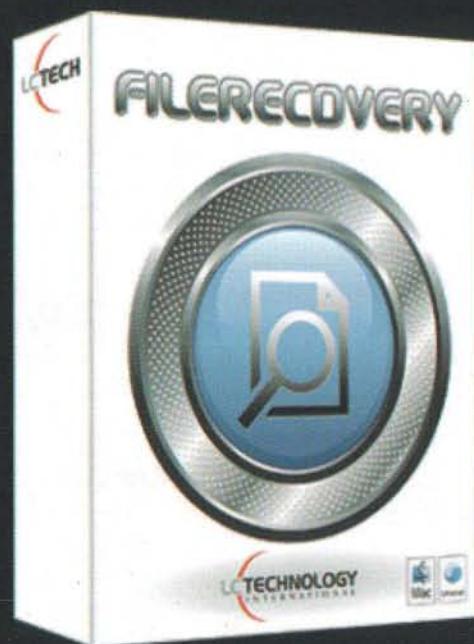
**Listing 3: MyWindowController.m**

```
#import "MyWindowController.h"
```

```
@implementation MyWindowController
@synthesize sampleCheckbox = _sampleCheckbox;
- (id)init
{
    self = [super initWithWindowNibName:@"MyWindow"];
    return self;
}
- (IBAction)toggleCheckbox:(id)sender
{
    NSLog(@"Checkbox state: %d", [_sampleCheckbox state]);
}
@end
```

The outlet and action are fairly straight forward, and the only interesting bit is the constructor. We're calling `NSWindowController`'s constructor and giving it the name of the nib to load.

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Of course, this nib file doesn't exist yet, so let's create a new nib file with a window. You can do this in Xcode by using the **New File...** menu. Select the **Window XIB** file all the way at the bottom of the **Cocoa** section, as shown in Figure 12. Name the new file **MyWindow.xib**.

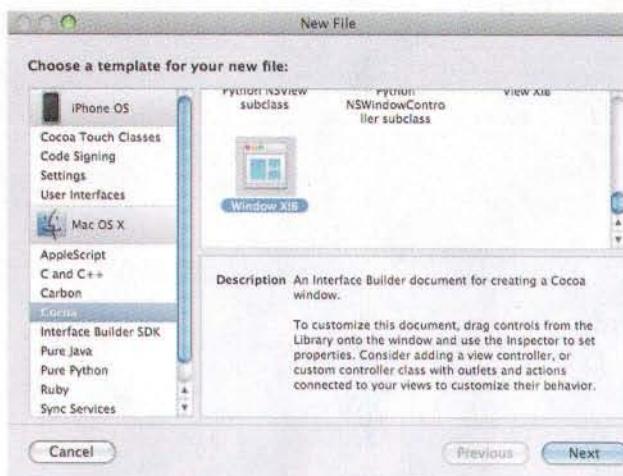


Figure 12: New Window XIB

Double click on the new **MyWindow.xib** file to open it up in Interface Builder so we can customize it. Before adding controls to our window, we should setup **File's Owner** to represent our

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window controller. **File's Owner** is a bit of an oddball object in the nib. It's not freeze dried in the nib like the other objects. It's the object responsible for cleaning up the nib when it's no longer needed and it usually loads the nib, too. By default, the **File's Owner** class is set to **NSObject** instance; however, we can customize this. Since the **NSWindowController** sets itself up to be the owner of the nib, we can change **File's Owner** to our subclass. Go to the **Identity** tab and change the class of the object to **MyWindowController**, as shown in Figure 13.

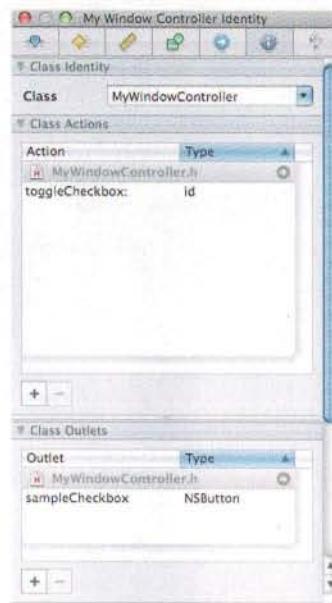


Figure 13: File's Owner class

This allows us to use **File's Owner** as a destination for outlets and actions. Resize the window and add a checkbox to it, as shown in Figure 14. Now let's setup the outlets. There are actually two outlets we need to setup. We've got the **sampleCheckbox** outlet that we created in our subclass, and this needs to be hooked up to the checkbox button. But **NSWindowController** has its own outlet called **window**. You need to hook this up so the window controller knows which window to open when **showWindow:** is called. Finally, hookup the action of the checkbox to the **toggleCheckbox:** action of **File's Owner**.

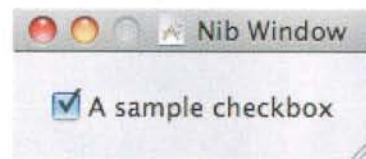


Figure 14: Nib window

We're almost done. We need to tweak the attributes of the window itself. Specifically, we need to uncheck **Release On Closed** and **Visible At Launch** and check the **One Shot** attributes. The window controller takes care of making the window visible, so

we do not want it visible at launch. The rationale behind the other two attributes is the same as noted above.



Figure 15: Nib window attributes

And that should be all the changes we need. You should be able to run the application and view the new window. Listing 4 is the full code for the `AppDelegate.m` file.

#### Listing 4: AppDelegate.m

```
#import "AppDelegate.h"
#import "MyWindowController.h"

@implementation AppDelegate

@synthesize mainWindow = _mainWindow;

- (IBAction)showAlertSheet:(id)sender
{
    NSAlert * alert = [[NSAlert alloc] init];
    [alert setAlertStyle:NSWarningAlertStyle];
    [alert setMessageText:@"Message Text"];
    [alert setInformativeText:@"More detailed text."];
    [alert addButtonWithTitle:@"OK"];
    [alert addButtonWithTitle:@"Cancel"];

    [alert beginSheetModalForWindow:_mainWindow
                           modalDelegate:self
                           didEndSelector:@selector(alertDidEnd:result:contextInfo:)
                           contextInfo:nil];
}

- (void)alertDidEnd:(NSAlert *)alert
    result:(NSInteger)result
    contextInfo:(void *)contextInfo
{
}
```

```
if (result == NSAlertFirstButtonReturn)
    NSLog(@"OK pressed");
else if (result == NSAlertSecondButtonReturn)
    NSLog(@"Cancel pressed");

- (IBAction)showAlertWindow:(id)sender
{
    NSAlert * alert = [[[NSAlert alloc] init] autorelease];
    [alert setAlertStyle:NSWarningAlertStyle];
    [alert setMessageText:@"Message Text"];
    [alert setInformativeText:@"More detailed text."];
    [alert addButtonWithTitle:@"OK"];
    [alert addButtonWithTitle:@"Cancel"];

    NSInteger result = [alert runModal];
    if (result == NSAlertFirstButtonReturn)
        NSLog(@"OK pressed");
    else if (result == NSAlertSecondButtonReturn)
        NSLog(@"Cancel pressed");
}

- (IBAction)showWindowFromNib:(id)sender
{
    if (_myWindowController == nil)
        _myWindowController = [[MyWindowController alloc]
        init];
    [_myWindowController showWindow:self];
}

@end
```

## Conclusion

As you can see, it's actually quite easy to display windows, even when using separate nib files. I highly recommend putting each window and panel in its own nib file. Not only is it more memory efficient, but it also reduces the clutter of the nib. If you put all of your windows and panels in a single nib, it ends up getting confusing very quickly. Also using window controllers helps separate your code into more manageable chunks.

One thing I'm going to leave as an exercise for the reader is displaying custom sheets from a nib file. It turns out that you aren't limited to `NSAlert` for sheets. You can use any `NSWindow` as a sheet. You can use the `beginSheet:...` method of `NSApplication`. Read up on the [Sheets Programming Topics](#) for details on how to do this, which you can find on Apple's Developer Connection website or in the documentation included with Xcode.



## About The Author



**Dave Dribin** has been writing professional software for over eleven years. After five years programming embedded C in the telecom industry and a brief stint riding the Internet bubble, he decided to venture out on his own. Since 2001, he has been providing independent consulting services, and in 2006, he founded Bit Maki, Inc. Find out more at <http://www.bitmaki.com/> and <http://www.dribin.org/dave/>.

# Pulse Smartpen and Livescribe Desktop

By Dennis Sellers

LiveScribe (<http://www.livescribe.com>) debuted its self-titled, Mac-compatible software for the Pulse smartpen at January's Macworld Conference & Expo, where it won a Best of Show award from MacTech and Macsimum News. It's a specialized product with a bit of a learning curve, but, for a certain group of users, it could be invaluable.

Livescribe's Pulse smartpen captures handwriting and simultaneously records audio and synchronizes it to the writing so you don't have to miss a word you hear, write or speak. Students, medical professionals and others may find this dual purposing a timesaving and efficient way to improve their workflow.

Not only can you record, but, after recording, you can tap on your notes to replay what was recorded from the exact moment you started writing.

With the Livescribe Desktop software, notes and audio recordings can then be transferred to a Mac, where they can be digitally stored, searched, or shared. A short demo of the Livescribe Desktop software is available at <http://www.livescribe.com/smartpen/desktop.html>. The Livescribe Desktop software for Mac will be available as a free download at <http://www.livescribe.com/install> on February 17.

The Livescribe/Pulse combination comes with a training notebook, which you'll have to work through to use the technology efficiently. The notebook is filled with icons that you tap with the Pulse smartpen to activate features and walk you through those features.

First, you must set the time and date on the smartpen. That's important because files you create with your smartpen are named using the time and date they're created.

You should note that the Pulse smartpen requires Livescribe dot paper. This paper is standard paper but with printed microdots on its surface. These dots are nearly invisible to the human eye. However, the smartpen can see these dots and uses them to know which page you are writing on and the exact location on that page. The smartpen can even see these dots through the ink you write on your pages.

Livescribe dot paper products sometimes re-use dot pattern. As a general rule, you shouldn't use Livescribe dot paper products with the same dot pattern at the same time. This prevents a



problem that can happen when viewing your notebooks in Livescribe Desktop: when you write in two notebooks with the same pattern, your notes from the second notebook will be superimposed on your notes from the first notebook when you view them in Livescribe Desktop.

When you power on the Pulse smartpen and begin writing on Livescribe paper, the smartpen captures and stores the notes you write. The Pulse makes use of the Nav Plus, a paper-based, five-way navigator that enables you to navigate through the smartpen Main Menu and application menus.

To capture your writing, the smartpen uses its built-in infrared camera to take digital snapshots of the dot pattern as the tip moves over the paper as you write.

When recording audio using the Paper Replay application, the smartpen links the recorded audio to your notes based on the dot pattern on the page. With this information, the smartpen can play back the audio that was recorded at the exact time you were writing your notes.

While your smartpen is paused, it will continue to capture a copy of your digital notes. Any notes that you write after you tap pause are linked to the audio that occurred the moment before you tapped Pause. When you tap on notes that were written while paused, your smartpen will play back the recording from the moment just before you tapped Pause.

There are several ways to control the playback of an audio file on your smartpen and quickly locate any section of the audio file. You can also adjust the playback speed. However, audio that's played back either sped up or slowed down is no longer in stereo. Audio plays in mono until it's returned to normal speed. The Pulse smartpen also supports Bookmarks, which allow you to flag a section of audio and later jump to it.

You can add bookmarks while you're recording or later when you are listening to your audio session. After you've added bookmarks to an audio session, you can scan through the bookmarks using the Previous and Next bookmark buttons.

If you want to record audio but can't or don't want to write on Livescribe dot paper, you can create a "paperless" Paper Replay session. To create a paperless session, begin recording audio and don't take any notes. The new paperless session will appear in the Paper Replay session list.

The Pulse also supports background recording, which lets you launch and run another Pulse smartpen application while you're using the Paper Replay application. Paper Replay will continue recording in the background, but no ink is linked to any audio, because the new application you launched is receiving the input from your pen strokes.

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You can use the Audio quality setting to change the compression rate of the recorded AAC audio – the higher the audio quality, the lower the compression rate. As a result, files recorded with the highest audio quality setting will be larger files that require more storage space. These settings can't be changed during recording. Always select the appropriate audio quality setting prior to recording.

Additionally, you can change the smartpen microphone sensitivity for different recording situations. Again, these settings can't be changed while recording, so always select the appropriate microphone setting before beginning a recording. The microphone will stay set at the last setting you chose, so make sure you set it back to Automatic after each use.

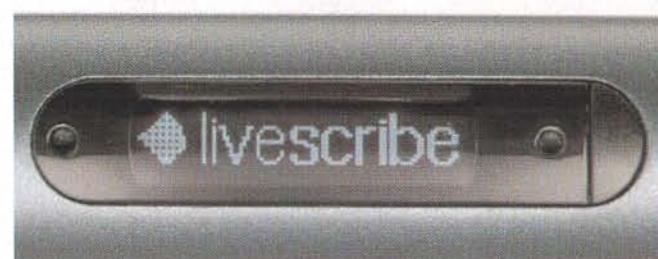
The Pulse set sports a calculator that's located on the inside covers of your notebook performs basic math functions, as well as many scientific, financial, and statistical functions. Quick Commands let you write a one-line command with your Pulse smartpen and get an immediate response on your smartpen display.

With the Translator Demo, you can translate a small set of words and the numbers zero to nine from English into Spanish, Swedish, Arabic, or Mandarin. By writing a word in English in your notebook, you can see and hear correct translation from your Pulse smartpen. It's a clever feature, but the number of words is very limited.

The Livescribe Desktop has existed as a Windows solution for a while before a Mac version was released. But now that it's here, it has some features available only for Mac users. Mac users can export and share their notes as PDF files locally from Livescribe

Desktop. They can export audio files (in AAC format) separately from notes so they can play them back in iTunes. And they can change the on-screen ink color of their digital notes.

You connect the Pulse to your Mac via an USB cradle. The cradle also charges the pen.



The Pulse smartpen is available in two models. Priced at US \$149, the 1GB model provides storage for over 100 hours of recorded audio. At \$199, the 2GB model doubles the storage capacity.



## About The Author

**Dennis Sellers** is a long time journalist. He started in the newspaper business, but has been in the online journalism business for the past 15 years. He's the editor/publisher of Macsimum News (<http://www.macsimumnews.com>)

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# Jean-Daniel Dupas

Ninsight - <http://www.ninsight.fr/UK/>



## What do you do?

I'm employed at Ninsight. This is a small French company specialized in subtitling, asset management and broadcast software. I'm a Software Designer & Developer, but I'm also doing project management.

Actually, the company previously provided software for Windows only but one year ago, it decided to expand its market to Mac users. My job is to study and develop these new Mac OS X products.

One of my activities is to find solutions and develop small utilities to improve our Windows product's interoperability with the Mac.

My other main activity is to develop new Mac software that will not have a Windows counterpart. That allows me to use all wonderful Mac OS technologies (like OpenGL, CoreVideo, CoreImage, CoreAnimation, QuartzComposer) without having to bother with portability issues.

Actually, we do not plan to port all of our existing Windows products to Mac OS, as the needs and market are very different.

I'm also in charge of some networks services (intranet servers, subversion, backup).

## How long have you been doing what you do?

I started this job one year ago.

## What was your first computer?

The first time I saw a computer, I was five year old. It was a Macintosh Plus my father bought. I spend a lot of time playing Lode Runner and drawing wonderful artworks (for a 6 year old kid) in MacPaint ;-)

The first computer I bought was a PowerMac G4 QuickSilver 733Mhz (July 2001). Just in time to start the Mac OS X transition.

I still use it from time to time.

## Are you Mac-only, or a multi-platform person?

I'm only using a Mac at home, but I'm also using Windows for some specific development at work.

I'm also using a Unix/Linux platform to build low-cost servers for the company network.

## What's the coolest thing about the Mac?

This is a developer point of view, but one thing I find really cool is that you can have developer tools for free. I'm not talking about some stripped down version of the official tools, but the whole developer tools collection: Xcode IDE, the profiling tools, the packaging tools, and a lot more.

## What is the advice you'd give to someone trying to get into this line of work today?

If you want to do it well, this is a very time consuming activity. You will have to be patient, and take the time to learn how the OS and the API works, even if you already are an experienced developer on other platform.

Buy a book, start with small projects, take the time to read the API programming guide on the Apple site, and don't expect to be able to do some complex project without having a strong understanding of how things works.

## What's the coolest tech thing you've done using OS X?

There is so much to do technically, that I don't know what to answer. There are some cool (but very technical) things to do at the Mach and BSD level.

I did some cool things like a Wiimote driver, but one of my favorite projects is an engine to generate and play video in real-time. It uses all the "Core\*" API of OS X to read frames from different sources (Video cards, movie files, Quartz Composition, etc.), it transforms them and apply all kind of effects (CoreImage, GLSL, Quartz Compositions) and then it plays them on screen, or it sends them to a video device (or both). I'm planning to use it as the basis for a broadcasting solution.

## Where can we see a sample of your work?

My professional projects are not released yet, but you can see some of my freeware at <http://www.shadowlab.org/softwares/>

And for the record, here are two Open Source projects I did:

A Wiimote Driver (which should be updated soon): <http://code.google.com/p/wiimotekit/>

A XAR manipulation (an open source archive format) Objective-C library: <http://code.google.com/p/sarchivekit/>

## The next way I'm going to impact the Mac universe is:

I do not have any plan yet, and I do not have a lot of free time those days, so I don't think I'm going to start new personal projects.

But who knows what the future is made of ;-)



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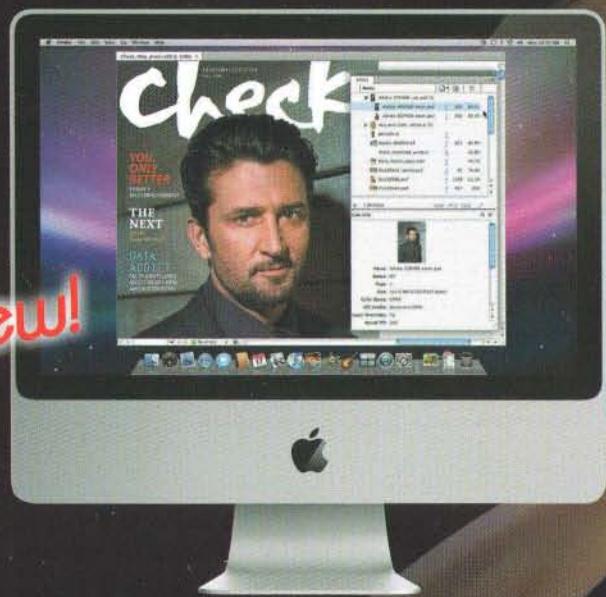
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